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The overall purpose of this research was to examine the dietary and health perceptions, behaviors, knowledge, and interests of newcomer youth (ages 12–17) and caregivers.

This work included three components: facilitated discussions with caregivers, facilitated discussion and semi-structured interviews with adolescents, and a survey (including BMI assessment) with adolescents. In the first phase, the focus groups with caregivers ( $n=38$ ) revealed interest in receiving community based nutrition education, assistance utilizing food labels, learning to cook and taste test local/American foods, as well as diet-related chronic disease concerns. Caregivers also expressed concern regarding the lack of healthy options in restaurants and lack of fruits and vegetables in their children's diets.

In the second phase, a facilitated discussion and semi-structured interviews were conducted with adolescents ( $n=9$ ) which focused on changes to diet and physical activity as well as nutrition and health literacy. Themes identified via content analysis revealed consistent perceptions of reductions in physical activity upon arrival. Participants consistently described the many ways they were active prior to arriving to the U.S. and the limited current opportunities. This was in contrast to dietary changes, in which participants reported their diets to be similar to pre-arrival (however, they also listed a variety of new foods they were eating after arrival to the U.S.). Participants described

health as a concept of “balance” (e.g., limiting junk, sugar, fat, and salt, and eating fruits and vegetables) and also mentioned the value of physical activity in supporting health. Female participants expressed many concerns regarding weight gain and a desire to lose weight.

In the third phase, a survey and BMI data were collected from adolescents ( $n=67$ ). Approximately one-third (31.5%) were overweight/obese. Nearly 46% (45.8%) reported they believe their weight to be “good” and participants with positive body satisfaction were more likely to be within the normal BMI range ( $p=0.010$ ). Nearly 47% (46.8%) have tried to lose weight. Dietary acculturation scores were marginally (and positively) associated with BMI ( $p=0.057$ ). Significant relationships between dietary acculturation and the value of convenience ( $p=0.003$ ) and observing Americans eat foods ( $p=0.030$ ) were also identified. Taste and cost were also significantly associated with BMI with those with a higher BMI more likely to value taste and less likely to be concerned with cost ( $p=0.010$  and  $p=0.009$ , respectively). Just over 85% (85.3%) had tried four or more new foods and the largest factors influencing food choices included health (70.1%), taste (55.2%), religion (45.3%), and convenience (44.6%). Significant increases in consumption of milk, fruit juice, soda, and meat were identified between pre- and post-arrival reported intake frequencies ( $p=0.009$ ,  $p=0.002$ ,  $p=0.026$ , and  $p=0.010$ , respectively). Students reported they wished to be more physically active (84.8%) and have more opportunities to play more sports (84.7%). Students were more likely to associate physical activity with health in comparison to diet (83.1% vs. 41.5%), and 56.7% agreed with the statement “I am healthy.”

This work suggests many areas of concern for newcomer adolescents including body dissatisfaction and poor body image, limited access to physical activity, and rapid dietary changes (negative and positive), as well as many areas of interest for nutrition education with caregivers. Many areas of concern as well as of interest were identified in this newly-arrived and diverse study population that may guide future nutrition education and health promotion research and programming.

LET'S TALK ABOUT FOOD: AN EXAMINATION OF THE DIETARY AND  
HEALTH PERCEPTIONS, BEHAVIORS, KNOWLEDGE, AND  
INTERESTS OF NEWCOMER YOUTH  
AND CAREGIVERS

by

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## APPROVAL PAGE

This dissertation, written by Lauren Rogers Sastre, has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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I would like to thank my parents for raising me to be curious, exploratory, and to ask questions. I would like to thank my great grandfather Carl Shelton and my grandmother Margaret Rogers for initiating my interest in other cultures and in social justice. I would like to dedicate this work to my Abuela by marriage Raquel Sastre and her son, my father in law Aristides Sastre who (in addition to their family) bravely left their home in Cuba to be “newcomers” here in the U.S. I am especially grateful for their grandson and son who is my biggest supporter, encourager, and the love of my life—my husband Cameron Sastre. I would also like to dedicate this work to my two sons James

and Theodore who have kept me balanced and who have ensured I always have something to smile about. Thank you!

## PREFACE

I can remember as a young child visiting my maternal great grandparents and paternal grandparents and observing the various items they brought home from their world travels (e.g., hunting masks and spears from Kenya, glass from Italy, porcelain from Britain, steins from Germany). I remember listening to stories my paternal grandparents would tell from having lived all over the world and tasting dishes and foods they picked up along the way. I can remember growing up and loving any opportunity to do a project on a population or a country and learn about what they ate, how they did things, social customs, the geography—everything that was new, unique, and different than my life and experience here in the U.S. I still remember completing a project in the third grade about China and gluing rice into the corner of the poster board to represent the staple of the diet.

I believe my interests in other cultures, in addition to a desire to work with groups experiencing health disparities, lead to my interest in the newcomer's experience. Newcomer households have been associated with elevated levels of food insecurity, chronic disease and/or malnutrition risks, limited access to quality healthcare, poverty, and difficulty navigating the American life and systems (e.g., medical services, grocery stores) upon arrival in addition to cultural and language barriers. Some research also suggests, due to globalization, that many groups are being exposed to components of the westernized diet and convenience foods and snacks prior to arrival to the U.S.,



demonstrating a more complex picture of dietary acculturation or “dietary change” in the U.S.

Newcomer youth (in contrast to young children) have more memory of their previous culture and dietary habits as well as cultural health beliefs; however, they will be thrust full force into American culture as they enter the public school system. They are unique in the time of their life in which they are physically (e.g., bone mass) and socially developing as adults (e.g., more independence over diet). Newcomer youth have also been suggested to play an integral role as cultural and lingual brokers, helping parents navigate their new life and may have a unique influence and control over household decisions. In addition, newcomer youth have been reported to experience rapid dietary acculturation with many new negative behaviors (e.g., fast food, convenience foods). Caregivers and youth, particularly from some more recent incoming groups, are understudied, and newcomer youth specifically are understudied despite suggested high levels of health and nutrition related risks.

To begin my work, I conducted a preliminary study in which I interviewed service providers ( $n=40$ ) with a wide range of expertise (e.g., physicians, nurses, resettlement caseworkers, ESL teachers, faith-based volunteers, etc.) from Guilford County, a diverse and central county located in the piedmont of North Carolina with a large immigrant and refugee population (60,000+ locally). I found perceptions were consistent across participants.

Resettlement housing was reported to be in poor condition, located in areas of poverty with transportation barriers. Refugees rarely relocate due to strong community relationships and support. Perceived dietary risks included difficulties budgeting and maintaining food assistance, hoarding food, high consumption of sodas and sweets, and limited health knowledge. Youth were reported to be exposed and rapidly acculturate to western foods, which caused stress and frustration for their parents. Respondents reported that most refugee groups prefer “fresh” foods, have strong agricultural skills, and lack green space. Major barriers to health care reported were poverty, short duration of initial Medicaid coverage, and language (both lack of interpretation services and translated materials). A variety of chronic conditions were consistently observed with type 2 diabetes, weight gain, and dental problems being the most frequently reported conditions across groups.

The high level of chronic disease risk and concerns with these groups, in addition to generational differences in dietary acculturation, became the focal point for this research. I was interested in what the parents needed and the unique perceptions and changes the youth experience. Lastly, I was curious about trends due to common experience as a “newcomer” and also how groups varied in their approach to and perception of changes, experiences, knowledge, and interests. What is similar between newcomers as they are “new” to the U.S. and what is unique because of variances in culture, religion, gender, and experiences prior to arrival? What do they try first? Why? How are new things introduced? What is valued and would drive healthier choices? This

research seeks to fill some of the many gaps within the literature so that these understudied (and often marginalized groups) may be better understood to support their nutrition and health in the future.

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## CHAPTER I

### INTRODUCTION

In a report by the U.S. Census Bureau, it has been projected that by 2020 over half of the children in America will be of an ethnic minority.<sup>1</sup> By 2060 the total minority population will reach 56% (it was 38% in 2014), with one in five individuals expected to be foreign born.<sup>1</sup> The U.S. population will likely grow from 296 million in 2005 to 438 million in 2050 with 82% of that growth from immigrants and their U.S.-born children.<sup>2</sup> The top immigration categories include family sponsorship, employment, and refuge/asylum (in order of decreasing frequency). The largest immigrant groups are arriving from Mexico, China, India, and the Philippines (2013, by decreasing frequency).<sup>3</sup> The Hispanic population is the fastest growing as well as the “largest minority” group.<sup>1,2</sup> The majority (in 2013) came from Mexico, Dominican Republic, Cuba, Columbia, and El Salvador (by decreasing frequency).<sup>3</sup> In addition, many refugees (most coming from Africa, Southeast Asia, and the Middle East) will add to the changes in America’s population.

Of incoming groups, refugees make up the smallest proportion; however, the U.S. receives the largest share (and majority) of resettled refugees. Since the United Nations Refugee Convention in 1951, a refugee has been defined as an individual with

a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country

of his nationality, who is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country.<sup>4</sup>

To obtain refugee status an individual is identified by the United Nations High Commissioner for Refugees (UNCHR). After identification a refugee may (a) return home, (b) integrate into a neighboring host country, or (c) face resettlement into a third country.<sup>4</sup> It is this third category for which the U.S. receives the largest majority worldwide; however, this is also the smallest fraction of displaced individuals and refugees worldwide. Out of roughly 15 million refugees around the globe, only one percent will be resettled into a new country and over half will end up in the U.S.<sup>5,6</sup> In 2012, 74,835 refugees were identified by the UNCHR and the U.S. received 50,097.<sup>7</sup> In 2012 the top countries of origin listed in decreasing frequency included Myanmar (formerly known as Burma), Iraq, Bhutan, and Somalia.<sup>7</sup> Resettlement to a country like the U.S. is based on legal and/or physical protection needs, lack of alternatives, violence or torture, women and girls at risk, medical needs, family reunification, and children and adolescents at risk.<sup>7</sup>

Refugees resettled in the U.S. are prioritized and processed through the U.S. Refugee Admissions Program and are connected with local resettlement agencies.<sup>8</sup> Resettled refugees are afforded the same rights and services as citizens.<sup>6</sup> U.S. Resettlement reached an all-time high in 1980 (207,116) and low after September 11th in 2002 (27,100).<sup>9</sup> Factors influencing refugee health are complex and may include conditions and risks from both the country of origin and host country (camp).<sup>10</sup> Refugees

often face unmanaged acute and chronic conditions, micronutrient deficiencies as well as mental health needs.<sup>10</sup>

Pre-migration nutrition and health concerns, culture, health literacy, amongst other factors vary widely between incoming groups, making health promotion and the provision of health and social services with newcomers complex. Data from the World Health Organization's Nutrition Landscape Information System (NLiS) demonstrates a few examples of the diversity of child and maternal nutrition concerns from countries from which the U.S. receives large groups of refugees or immigrants.<sup>12</sup> See Table 1.1.

Table 1.1

Nutritional Markers from the World Health Organizations Nutrition Landscape Information System

	% < 5yrs underwt	% < 5yrs ov/ob	% women ≥ BMI 25kg/m <sup>2</sup> (ov/ob)	% of women exclusively breastfeeding (1st 6m)	% Anemia < 5 yrs (Hb <110 g/L)	% Population below minimum level of dietary energy intake
Myanmar	22.6%	2.6%	n/a	11%	n/a	19.7%
Iraq	8.5%	11.1%	69.6%	12.8%	n/a	26.0%
Bhutan	12.8%	7.6%	n/a	14%	80.6%	n/a
Somalia	32.8%	4.7%	n/a	6.3%	n/a	66.3%
Mexico	2.8%	9%	71.9%	12.3%	23.7%	n/a
Dominican Republic	4%	7.6%	38.3%	9.4%	n/a	15.4%
El Salvador	6.6%	5.7%	57.2%	48%	19.8%	12.3%

For example, although individuals from El Salvador and Mexico could be grouped together (both from Central America), 12.3% of women exclusively breastfeed the first six months in Mexico in comparison to 48% in El Salvador. Nearly 81% (80.6%) of children under five years of age have been found to be anemic in Bhutan in comparison to 19.8% in El Salvador. In Somalia, over 66.3% of the population does not meet daily energy requirements, and 32.8% of children under five years of age have experienced wasting (below 2 standard deviations from median weight for height)<sup>11</sup> in comparison with 12.3% and 1.6%, respectively, in El Salvador. Over vs. under nutrition risks vary strongly between countries of origin; moreover, variances also exist in health, cultural food practices, and diet, as well as health beliefs and health literacy.

To alleviate some initial burden for refugees, they will receive services (although limited in length, approximately three months initially; e.g., SNAP, Medicaid, finances for housing, assigned a caseworker, social orientation) to help settle into their new lives in the U.S. This is in stark contrast to immigrants who must adjust and navigate their new home independently and for whom there are far less social and health services available.<sup>8</sup> While refugees often have traumatic pre-resettlement experiences and have fled conflict and/or resided in refugee camps (frequently leading to a lack of nutrition and health resources pre-migration), immigrants will face common post-migration cultural, language, and socioeconomic (lack of financial resources and/or education) barriers heightening their risk.

Most of these incoming refugees and immigrants will relocate to a select ten U.S. states. Of these states, North Carolina has ranked in the top ten in 2012 for refugee

resettlement and receives high numbers of immigrants annually.<sup>9</sup> In 2013, North Carolina was home to 749,426 immigrants with 31.9% naturalized U.S. citizens with high numbers of Asian and Latin American immigrant populations.<sup>10</sup> There were approximately 350,000 unauthorized immigrants in North Carolina in 2013.<sup>10</sup> In addition, 2,110 refugees arrived in 2012 with most initially resettling in Charlotte, Durham, Greensboro, High Point, New Bern, and Raleigh.<sup>12</sup> The largest refugee populations in North Carolina include the following countries of origin: Myanmar, Bhutan, Iraq, Cuba, Eritrea, Democratic Republic of the Congo, and the Sudan.<sup>12</sup>

Immigration rates in North Carolina and the U.S. remain relatively stable as global conflicts continue and individuals seek economic opportunity. Despite annual resettlement and migration to the U.S. and increases in diversity, newcomer health and nutrition research and resources are limited. This is of particular importance as newcomer populations have demonstrated higher risks for nutrition concerns and health disparities. Research regarding the unique health and nutrition needs, barriers, knowledge, and attitudes of newcomer populations is lacking, likely due to the complex nature of accessing and intervening (i.e., language and cultural barriers) with newcomer populations. Moreover, improved health within these populations is a national priority based on guidelines such as Healthy People 2020, which focus on eliminating health disparities and ensuring improved health for all people.<sup>13</sup>

The goal of this research is to examine the nutrition and health perceptions, behaviors knowledge, and interests of newcomer youth and families (residing in the U.S. for no more than one year). Improving knowledge of the changes newcomers have

experienced, their perceptions, knowledge, and interests will serve to better guide future services, interventions, and resources to reduce disparities and promote equity of health for *all* Americans.

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## **CHAPTER II**

### **LITERATURE REVIEW**

#### **Pre-Arrival Risks and Needs: A Complex Picture of Too Little, Too Much**

Immigrants and refugees arrive to the U.S. with a wide range of health and nutrition needs relating to the diversity of their pre-arrival experiences and environments. Research with newcomers should include pre-migration conditions to provide context to current needs, behaviors, and perceptions. Access to resources (e.g., food and water, healthcare), experiences (e.g., war, poverty, violence), socioeconomic status and prior education, culture, ethnicity and/or tribal affiliations, and religion can strongly influence behaviors, perceptions, and needs upon arrival to the U.S. Moreover, the differences in factors leading to migration to the U.S. (e.g., choice of an immigrant vs. refugee fleeing persecution, active war) must also be taken into the context of needs post-arrival. The literature reviewed in the following sections will focus on regions of the world and populations that provide high numbers of immigrants and/or refugees annually (e.g., Central America immigrants and refugees from Middle East, Southeast Asia, and Africa).

#### **Pre-Arrival Nutrition Concerns: Refugees**

Many refugees arrive from regions in which women and children are vulnerable for undernutrition, particularly in developing countries where rates of poverty and conflict are high.<sup>1</sup> Food insecurity, micronutrient deficiencies, communicable diseases, poor child feeding practices, and lack of knowledge are common risk factors. Non-

exclusive breastfeeding (for the first 6 months), risky complementary-feeding practices, and poor maternal nutrient status further exacerbate these risks.<sup>1,2</sup> Displaced individuals are at greater risk for poor feeding practices and micronutrient deficiencies due to separation from protective social and economic environments as well as increased poverty and food insecurity.<sup>1</sup> Child malnutrition is highest in Southern Asia (30%), Southeast Asia (16%), and Western, Eastern, and Middle Africa (20%, 19%, and 16%, respectively) and it should also be noted that these regions have produced some of the highest refugee populations resettling in the U.S. including the individuals from Bhutan, Myanmar, and Somalia.<sup>3</sup>

Data collected through the Nutritional Landscape Assessment provided by WHO indicates alarming rates of malnutrition (underweight, stunting, and wasting) in children under five and below minimal dietary energy consumption from Nepal, Somalia, and Myanmar.<sup>4-6</sup> Additionally, micronutrient deficiencies and low exclusive breastfeeding rates (for the first 6 months) have been reported in Myanmar and Somalia. Conversely, Iraqi refugees demonstrate conditions associated with westernized nations with overweight and obesity being major risk factors.<sup>7</sup>

Indicators of malnourishment such as stunting, underweight, and wasting are prevalent experiences of many refugees before displacement to a nearby host country. Upon arrival in the host country (or camp), rations and food assistance is often inadequate in total energy, protein, and micronutrients. Research in camp settings frequently focuses on women and children, especially children under five years of age, as they are the most sensitive to health and nutritional conditions and are easily comparable

to growth and development standards.<sup>8</sup> Malnourishment (stunting, underweight, and wasting) has been observed in camps in both Southeast Asia and Africa, especially for children between 3–6 months and 24 months and children under five years of age.<sup>8-12</sup> Micronutrient deficiencies in Vitamin A, iron, and/or anemia are commonly observed in Southeast Asia as well as African camp settings.<sup>10,11,13,14</sup> Less than minimal energy and protein requirements have also been reported in camp settings.<sup>8-11,13</sup> Malnourishment and undernourishment (stunting) have been observed simultaneously, with increased rates of overweight and obesity in a long-term camp with Western Sahara refugees.<sup>12</sup> Not all regions share the same concerns.

For example, Iraqi refugees ( $n=18,990$ ) screened from camps in Jordan en route to the U.S. demonstrated more westernized issues with elevated rates of obesity, diabetes mellitus, and hypertension.<sup>15</sup> In another study in Lebanon, 47.9% of Iraqi refugees were diagnosed with a chronic condition.<sup>16</sup> Further complicating matters are also the location Iraqi refugees initially resettled (e.g., Lebanon, Jordan, or Syria). For example, stark differences in food security, malnutrition (under-nutrition), food aid, and hunger have been found between conditions in Jordan vs. Syria.<sup>17</sup> For Iraqis who reside in Lebanon, food insecurity with hunger was found to be 44.4%, vs. Syria and Jordan (19.7–21.5%), and food insecurity was found to significantly increase over time for Iraqi refugees in Lebanon.<sup>16,17</sup> For all Iraqis, food insecurity is associated with lack of access, diversity, and quality in the diet.<sup>16,17</sup>

### **Pre-Arrival Concerns: Central America**

Central American immigrants' nutritional concerns overlap with Iraqis and follow more modern, westernized issues due to the rapid globalization and modernization of lifestyles and diet. Overweight and obesity are concerns with Mexican and El Salvadoran populations prior to arriving to the U.S.<sup>18-20</sup> Advertising for modern convenience foods in El Salvador and high rates of snacking, particularly junk food snacks (soda, salty, sweet snacks) and decreased fruit and vegetable consumption in Mexico has been reported leading to a focus on overweight, obesity, and chronic disease (vs. previous concerns of undernutrition).<sup>18-22</sup> For example, between the 1980s and 1990s soda consumption increased 37.2% in Mexico and the increases in refined carbohydrates and fat also correlated with increases in chronic disease, weight gain, and obesity.<sup>20</sup> In addition to these modern dietary concerns, anemia and zinc deficiency (associated with stunting) are still prevalent in many Central American countries (El Salvador, Honduras) and food insecurity has also been identified (e.g., 64.8% households in El Salvador experience low food security) along with less quality and diversity in the diet.<sup>23-26</sup>

In summary, research from Central America reports nutrition concerns of more westernized countries as globalization and modernization of lifestyles and diet has impacted these regions. Nutrition and health condition(s) of refugees from the Middle East also follow westernized concerns comparable to Central American immigrants and include many diet-related chronic diseases. In contrast, research reviewing African and Southeast Asian refugees prior to resettlement (country of origin and camps) include acute conditions of malnourishment (stunting, wasting, and underweight) and

deficiencies in quantity and quality of the diet. This variety of pre-migration nutritional concerns increases the complexity in addressing health concerns within newcomer populations.

### **Nutritional Behaviors and Risks Post-Arrival**

Arrival to the U.S. presents a multitude of nutritional risks, barriers, and needs. Access to cultural foods has been perceived as sufficient as individuals resettle or migrate to areas with high numbers of immigrants and refugees (although cost may still be a barrier).<sup>27-30</sup> Food insecurity—lack of quantity and/or quality in the diet—is prevalent in newcomer populations regardless of the ethnic group studied, location of resettlement, or tool utilized.<sup>31-39</sup> Contributing factors include limited time in the U.S., low acculturation and language proficiency, poverty, low education, and difficulty navigating (identifying foods, shopping process, cooking) the food system.<sup>31-34,38,40,41</sup> Food insecurity has been associated with increased BMI, decreased glycemic control, and has been observed for multiple decades post-resettlement.<sup>34,40-43</sup> Increased consumption of fast food, convenience foods, and sugar sweetened beverages (SSB) has been reported across multiple groups.<sup>27,29,44-50</sup> Large generational disparities in dietary acculturation is regularly reported and frequently results in family tension.<sup>27,29,44-47,51-55</sup> A paradox appears to be occurring as older generations attempt to maintain cultural foods; yet, dietary acculturation continues (SSB and convenience foods).

In addition to dietary practices, knowledge and perceptions have been assessed. Basic concepts (e.g., sugar and fat are poor are unhealthy, fruits and vegetables are healthy) has been reported however, the impact of diet and excess weight on adverse

health outcomes faces a variety of barriers including: culture, religion or lack of nutrition and health knowledge.<sup>45,53,56-60</sup> Low physical activity (PA) levels and barriers or misconceptions regarding PA are consistently reported as well as increasing trends of weight gain and development of chronic conditions.<sup>27,30,44-47,58,61-65</sup> In summary, a multitude of risks exist for health related behaviors regarding diet and exercise upon resettlement.

### **Youth Acculturation and Generational Differences**

As previously cited, generational differences in dietary acculturation occurs with youth accepting Western foods at faster rates. Newcomer youth are quickly exposed to Western foods as they attend school. School offers many new foods—often convenience foods—but also milk and other sources of dairy. Dietary acculturation in Asian and Latino newcomer youth appears to have both positive and negative implications. Improved nutrient status with adoption of some foods (i.e., calcium found in dairy products) has been associated with increased acculturation; however, increases in fat consumption, total calories, increases in BMI, and adverse effects on blood pressure has also been reported.<sup>61-64,66</sup> Less acculturated newcomer youth report higher consumption of fruits and vegetables and diet quality.<sup>67-69</sup> Not all groups acculturate at equal rates or with equal outcomes.<sup>69-71</sup>

In a study by Allen et al., Latino and Asian youth were compared over several generations. Asian youth maintained health behaviors or improved regarding diet quality and physical activity, whereas Latino youth showed decreased diet quality over time.<sup>69</sup> In a study by Arcan et al., Somali, Hispanic, Hmong, and white adolescents were compared

and shared diet trends low in fruit, vegetables and dairy but high fast food consumption, with Hispanic and Somali teens consuming the most fast food.<sup>71</sup> Time, taste, and convenience have been described as influencing factors in increasing consumption of fast food and convenience foods in a study with Mexican, Cambodian, Sudanese, and Somali adolescents.<sup>53</sup> In another study, Mexican Americans completely acculturated to a Western diet, losing all components of their traditional diet within one generation.<sup>48</sup> These studies support findings from studies with caregivers cited previously, in which parents report their children request and desire Western foods, but also indicate acculturation is complex and may vary distinctly between ethnic groups and may result in positive and negative dietary changes.

Adolescents play a more active role in shopping and preparing foods for the family, and have more independence choosing or preparing their own foods, with newcomer youth reporting more participation in food selection and preparation.<sup>47,64,72,73</sup> Additionally, the role of adolescent newcomers as cultural brokers may increase their influence on the family diet.<sup>74</sup> Different cultures report differences in the power adolescents hold, with mixed influence reported in African homes and less influence in some Asian cultures.<sup>45,68,74</sup> Adolescents frequently demonstrate heightened sensitivity to peer pressure, social expectations, and body image, and these trends are no different for newcomer youth. Studies with African, Southeast Asian, and Hispanic youth all report attempts to modify their diet or increase physical activity in order to control their weight or “look/feel good.”<sup>47,67,71,72,74,75</sup> Dieting in youth may occur in contrast to generational differences in perception of weight with parents reporting attempts to increase children’s



weight, while youth report resistance.<sup>45,74</sup> Many adolescents report family members with chronic conditions, especially diabetes in African and Southeast Asian groups, however, weight, is rarely associated as a risk factor (sugar is most commonly identified and associated with diabetes).

In summary, dietary acculturation occurs rapidly in youth, varies between ethnic groups, and may result in healthful and/or risky dietary choices, and if not improved will likely lead to adverse health outcomes. Newcomer adolescents play a role in shopping and preparing food and also demonstrate body image concerns as well as reports of dieting or increased activity to modify body weight. Literature regarding attitudes, knowledge, perceptions, and interests of newcomer adolescents is limited, despite the potential health and nutrition risks associated with acculturation as “newly” adopted foods are often convenience and fast foods.

### **Health Access, Needs, and Risks Post-Arrival**

In addition to reported dietary and PA changes and concerns, newcomers experience health disparities common to other minority, low income groups. These include diet-related chronic conditions (diabetes, hypertension, increased BMI, dental concerns) as well as health care access barriers (e.g., transportation, finances, insurance).<sup>60,70,76-83</sup> Pediatric overweight and obesity (2–17 years) has been found to rapidly increase (17.3% to 36.4%, doubling in 3 years) in refugee children and youth with the most rapid increases during the first year.<sup>78</sup> Resettled refugees and immigrants face additional issues including limited or non-existent skills to navigate health care systems (i.e., making appointments, filling prescriptions, paperwork), language, literacy, and

cultural barriers, as well as mental health disorders including post-traumatic stress disorder (PTSD) which further complicates achievement of health upon resettlement.<sup>30,70,76,77</sup> Other risks including limited health care access, difficulties navigating healthcare in combination with nutritional risks (e.g., food insecurity, difficulties navigating the food environment), and reductions in physical activity in combination with cultural and language barriers further increase the vulnerability of newcomer populations. Long-term, the health of newcomers is highly at risk for poor outcomes, and achieving health equity is unlikely.

### **Considerations and Suggestions for Research with Newcomers**

Large barriers exist in the design and implementation of research with Newcomer populations due to their unique experiences, vulnerability, language, and cultural barriers.<sup>84</sup> Pre-migration (camp and/or host country) conditions further complicate health upon resettlement and potentially increase vulnerability and disparities shared with other marginalized, yet more established minority groups. Specific considerations regarding methodology outlined in a paper by Ogilvie et al. highlight the complexities in sampling (recruitment) as well as translation and interpretation.<sup>84</sup> It is suggested that researchers collaborate with trusted organizations serving refugees, are diligent to maintain cultural competency and sensitivity, and are aware of the complex methodological considerations in working with newcomers in order to access groups and collect quality data.

Other methodological considerations included are the approach with which an assessment is conducted. Work by Palermo et al., as well as Lapping et al., suggests that the context with which an assessment is framed (capacity focused vs. deficit/needs

oriented) will obtain different results—not necessarily conflicting results, but different information.<sup>85,86</sup> It may be important, based on these findings, to consider how questions are framed. Edberg et al. suggest that when working with newcomers evaluating (a) migration experience, (b) social adjustment, (c) socio-economic status (SES), (d) social support, (e) neighborhood characteristics, (f) health status, (g) health knowledge and practices, (h) access to care, and (i) perceived discrimination as health outcomes are impacted by a complex array of factors.<sup>87</sup>

In summary, the design and implementation of research with newcomers, particularly for refugees is complicated. Pre-migration experiences, methodological barriers, and language and cultural barriers, as well as the large array of social and environmental factors (often interrelated) driving health disparities must be considered.

### **Literature Summary**

There are many complexities and barriers to accessing and intervening with newcomer populations. Research with newcomers is limited; however, health and dietary concerns have been reported. Pre-migration concerns include both acute and chronic health and dietary needs, variable by country of origin and migration experiences (e.g., nutritional deficiency vs. excess). Pre-migration concerns include micronutrient and total energy/protein deficiencies, food insecurity, physical and psychological effects of trauma and violence, unmanaged or untreated health conditions, and increased exposure to western diet and related conditions due to globalization of the food market. Post-resettlement concerns include food insecurity, difficulty navigating food systems and products, dietary acculturation and associated chronic conditions (e.g., obesity, diabetes),

dental and psychological needs, and barriers to accessing and receiving quality medical care, as well as large generational variances in dietary acculturation. Risks, vulnerabilities, and poor health outcomes have been observed in several groups.

Many major populations resettling in the U.S. remain understudied, including populations from Bhutan, Myanmar (Burma), and Iraq, as well as a variety of African nations (e.g., Eritrea, Ethiopia, Sudan, Somalia) and Central American countries (e.g., El Salvador, Honduras) despite strong evidence of disparities and risks for these groups. The perceptions, knowledge, needs and interests of many of these groups remain unknown. Moreover, the perceptions, knowledge, needs, and interests of youth from these groups is very limited or non-existent (e.g., Iraqi, Burmese, Honduran, and El Salvadoran youth).

### **Significance**

The U.S. receives more refugees for resettlement than all other countries that partner with the United Nations worldwide combined. Commitment to refugee resettlement has not been matched with improved knowledge or resource development, despite national priorities for reducing disparities and obtaining health equity for all Americans. Trends of immigration from Central America continue and these immigrants have helped to grow the Latino population in the U.S. to the largest and most rapidly growing of minority groups. The vulnerability of groups, demonstrated health disparities, and lack of research requires improved data collection and health promotion within these groups. In addition, the increasing diversity of the U.S. further supports increasing and improving research conducted with newcomers to meet the needs of the current population in support of national goals relating to health equity for all people.

In light of the diet and health risks for newcomer populations and the consistently reported rapid process of dietary acculturation and diet and physical activity-related chronic disease conditions (e.g., diabetes, obesity), it is important to further investigate the process and influencing factors with which new foods are both introduced and chosen (both healthful and unhealthful foods). It is also of equal importance to identify pre-arrival food trends and physical activity levels in order to accurately identify changes or “acculturation.” For example, pre-arrival diets and physical activity trends are rarely evaluated; yet, to accurately identify change, it is necessary to have an informed picture of the original diet and physical activity levels. In addition, few studies have extensively identified factors that influence food choices in newcomer populations, particularly with youth who have been reported to rapidly accept westernized diets and trends of reduced physical activity and weight gain.

Many questions regarding dietary changes in newcomer groups remain unanswered, and many groups remain understudied despite high migration numbers. The influencing factors and process with which new foods are both introduced as well as chosen has been poorly investigated. In addition to these gaps, generational differences and the rapid dietary acculturation in youth has not been fully examined. The unique experiences and changes that youth undergo (memories and experience of country of origin and incorporation and introduction of Westernized foods and culture in the school system) is not well understood. The motivating factors shaping diet and PA behaviors of newcomer youth is unknown, despite evidence of rapid dietary acculturation, weight concerns and dieting behaviors, and reductions in physical activity. Examining the role of

the adolescent in food choices (shopping) and preparation may position them to hold an influential place in the dietary and physical activity of the household and provide insight to support future intervention(s).

Lastly, in summary, immigration and refugee resettlement remains steady in the U.S. Research is lacking, especially from specific countries of origin (e.g., Myanmar, Iraq, El Salvador). Many populations (especially children and youth) demonstrate high health and nutrition concerns pre-migration and upon resettlement. Rapid acculturation in youth and diet-related chronic conditions in adults has been observed; however, motivation, perceptions, attitudes, and interests have neither been well explored, nor has the role of adolescents in influencing the diet and health of the home/family upon arrival in the U.S. Research with newcomers is limited despite high numbers, reported disparities, and vulnerabilities contrasting a national commitment to health equity. Improving the knowledge of the changes, perceptions, knowledge, and interests of newcomer youth and families may be used to guide future intervention to reduce disparities frequently observed over time in newcomer (both immigrant and refugee) groups.

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### CHAPTER III

#### EXAMINATION OF THE NUTRITION CONCERNS, INTERESTS AND NEEDS WITH NEWLY ARRIVED CAREGIVERS DURING A NUTRITION EDUCATION SESSION

##### Abstract

**Introduction:** In 2012, North Carolina ranked in the top ten for refugee resettlement. New arrivals are understudied, yet at risk for food insecurity, nutrition-related health conditions, and have limited skills navigating the local food environment. The objective of this study was to examine the nutrition and health perceptions, interests, and needs for newly-arrived caregivers.

**Methods:** Data were collected from parents after a nutrition education session provided during family outreach at a school in North Carolina for newcomers. Participants ( $n=38$ ) included Spanish, Vietnamese, French, and Arabic speaking caregivers (most in U.S.  $\leq 1$  year). Facilitated discussions conducted via interpreters were recorded by handwritten notes. Themes were identified using content analysis.

**Results:** Interest in nutrition education topics included nutrition education in their community ( $n=31$ ), information/assistance using food labels ( $n=30$ ), tasting new healthy American foods ( $n=30$ ), diets to reduce risk of chronic disease ( $n=29$ ), foods important for children's growth and development ( $n=26$ ), and interest in a shopping companion to assist navigation of American products and grocery stores ( $n=20$ ). Independently initiated



areas of concern included poor diet choices of their children, limited healthy options in restaurants, and specific health concerns.

**Conclusions:** Results from this study demonstrate strong interest from a diverse group of newly-arrived caregivers regarding specific nutrition education topics. This interest in combination with their risk and vulnerability supports early provision of nutrition education for new arrivals. Future research should evaluate the impact of early interventions on food insecurity, diet quality, and chronic disease rates.

### **Introduction**

In 2013, 990,553 individuals became lawful residents in the U.S.<sup>1</sup> Leading countries of birth included Mexico (14%), China (7.2%), and India (6.9%).<sup>1</sup> In addition, in 2013, 69,909 refugees entered the U.S. with top countries of origin including Iraq (27.9%), Burma (23.3%), Bhutan (13.1%), and Somalia (10.9%).<sup>2</sup> Individuals entering under refugee status must fit within the specific criteria outlined by the Immigration and Nationality Act 101(a)(42) and must be “unable or unwilling to return to his or her country of nationality because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion.”<sup>3</sup>

Consistent levels of annual immigration rates (990,553 in 2013, 1,031,632 in 2012, and 1,062,040 in 2011) continue to impact the ethnic makeup of the U.S. which is projected by the Census Bureau to rapidly change between 2014 and 2060.<sup>1,4</sup> The foreign-born population is estimated to grow by 85% between 2014 and 2060, and by 2060 one in five individuals will be foreign born.<sup>4</sup> By 2044 whites will for the first time

be in the minority and the U.S. will switch to a “U.S. minority-majority” nation.<sup>4</sup> With this rapid increase in population, the fastest growing ethnic minority groups include “two or more races,” Asians and Hispanics, which are expected to grow 226%, 143%, and 115%, respectively.<sup>4</sup> As the diversity of the U.S. continues to increase over the next few decades, the health and nutrition needs of these groups must be examined in order to support national, state, and local health priorities and policies (e.g., Healthy People) that will address the health and nutrition needs of the current population while seeking to reduce health disparities that are unequally distributed in minority groups. Unfortunately, many immigrant, and especially refugee groups have not been well studied despite demonstrated risks.

Arrival to the U.S. presents a multitude of nutritional risks, barriers, and needs. Although access to cultural foods is often perceived as sufficient (although cost may still be a barrier),<sup>5-8</sup> food insecurity has been reported to be elevated in immigrant and refugee populations. Food insecurity—the lack of adequate quantity and/or quality in the diet—is prevalent in newcomer populations regardless of the ethnic group studied, location of resettlement, or tool utilized (e.g., national average is 14% in contrast to newcomer households which have been found as high as 53%, 67%, 85%, and even 96%).<sup>9-18</sup> Contributing factors include limited time in the U.S., low acculturation and language proficiency, poverty, low education, and difficulty navigating (identifying foods, shopping process, cooking) the food system.<sup>10-13,17,19,20</sup> Food insecurity has been associated with increased BMI, decreased glycemic control, with levels remaining high even multiple decades post-resettlement.<sup>13,19-22</sup> In addition, dietary change occurs and

increased consumption of fast food, convenience foods, meat, and sugar-sweetened beverages (SSBs) are consistently reported across various groups.<sup>6,8,23-29</sup> Youth and children are exposed to westernized foods during school and through WIC and their rapid adoption of new foods and reduced consumption of traditional foods is frequently reported and results in family tension.<sup>6,8,23-26,30-34</sup>

In addition to the potentially negative dietary changes, lifestyle changes and health literacy have also been examined with newcomer populations (although this work is limited). Basic concepts such as the need to maintain “balance” and the negative effects of sugar, fat, and salt have been reported as well as an understanding that fruits and vegetables support health, yet weight is rarely identified as a health risk (e.g., diabetes risk is strongly associated with sugar vs. weight and physical inactivity).<sup>24,32,35,39</sup> In addition to negative dietary changes, physical activity is frequently reported to decrease upon arrival to the U.S. with a multitude of barriers reported, as well as increasing trends of weight gain and development of chronic conditions (e.g., diabetes, hypertension).<sup>6,9,23-26,37,40-44</sup>

In summary, a multitude of nutrition and health risks exist for newcomers; however, research with these groups remains limited and continued assessment is warranted to examine the nutrition and health perceptions and interests of newcomers to better support resources and/or interventions that reduce negative dietary and physical activity changes upon arrival to the U.S. as well as chronic disease burden over time. The objectives of this study were to (a) examine the dietary perceptions, behaviors, and/or concerns of newcomer caregivers with upon arrival to the U.S., and (b) examine the

interests of newcomer caregivers regarding a variety of nutrition topics and/or educational opportunities.

## **Methods**

### **Study Design**

Facilitated group discussions were conducted during a bi-annual Saturday community outreach program at a school for newcomer youth in North Carolina in April of 2015.<sup>i</sup> Questions were based on a guide that was content validated by experts ( $n=3$ ) in the field of immigrant and refugee nutrition and health and/or family focused nutrition (see Appendix A). Questions targeted nutrition topics and concerns as well as preferences for future intervention and educational activity interests. The study was approved by the institutional review board at the University of North Carolina at Greensboro and the Research Review Committee of the school district prior to any recruitment and/or data collection. Informed consent was obtained prior to any data collection.

### **Site Description**

The study was conducted at a school for newcomer youth in North Carolina that provides a specialized environment for students during their first year in the U.S. North Carolina ranked in the top ten in 2012 for refugee resettlement and receives high numbers of immigrants annually.<sup>44</sup> North Carolina was home to 749,426 immigrants in 2013 with 31.9% naturalized U.S. citizens consisting of high numbers of Asian and Latin American immigrant populations.<sup>45</sup> There were approximately 350,000 unauthorized immigrants in North Carolina in 2013.<sup>45</sup> Also, there were 2,110 refugees who arrived in North Carolina

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<sup>i</sup> This description of the school is the wording required in agreement with the school district for confidentiality purposes for research conducted within the school system.

in 2012 with most initially resettling in Charlotte, Durham, Greensboro, High Point, New Bern, and Raleigh.<sup>46</sup> The largest refugee populations in North Carolina include the following countries of origin: Myanmar, Bhutan, Iraq, Cuba, Eritrea, Democratic Republic of the Congo, and the Sudan.<sup>46</sup>

To meet diverse population needs, the school employs part-time and fulltime onsite bilingual community liaisons who help school staff communicate with students and families as well as assist with navigating the wide range of cultures within which the school must work. The school also has an onsite fulltime social worker in addition to a guidance counselor. The school provides initial placement testing, instruction that meets grade level standards, and the opportunity for specialized introduction to educational procedures and culture in the U.S. The school also coordinates efforts with the local health (e.g., County Health Department, local pediatric community clinics) and social service organizations for support of students and families (e.g., immunization requirements, clothing, medical, and dental needs).

### **Family Day Description**

Family day is a bi-annual tradition at the school that is held on a Saturday during the fall and spring. Families are provided educational sessions from a variety of local organizations, many of which specialize in work with refugees and immigrants (e.g., Immigration specialists from Elon Law School, FaithAction International House, and Church World Service). Transportation is provided for attending families via school buses (although some families did drive themselves). Childcare was provided for students and children (siblings) in the school gym and families were divided among classrooms by

language needs for presentations from a variety of community organizations (e.g., a local immigration law clinic, variety of community organization providing social services to immigrants). Each organization was allocated 30 minutes to visit classrooms. Families were separated by language (interpretation needs) and presenters rotated between the classrooms based on a provided schedule by the school. Each interpreter (most were Community Liaison school staff) provided interpretation to support the presentations and help with questions from the families. The classroom groups included two Spanish groups (due to the large number of Spanish speaking families), a combined Vietnamese and Arabic speakers group, and a combined English and French speakers group. A Burmese group was planned for; however, due to a transportation issue the Burmese families did not make it to the family day.

### **Confidentiality, Translation, and Interpretation Services**

Community liaisons employed by the school were trained by the principal investigator regarding confidentiality and the scope of the research project within IRB requirements of The University of North Carolina for community partners assisting with interpretation and translation during research. Each Community Liaison provided written documentation acknowledging their commitment to the confidentiality of the families and data and their independent choice to participate in this research study. The community liaisons also translated and interpreted all written materials used for this study (with the exception of French, which was translated by an international student from The University of North Carolina at Greensboro, and French interpretation was provided by a former intern for the school).

### **Nutrition Education Sessions**

Nutrition education was provided by the primary investigator for the first 15–20 minutes of the allocated 30 minutes and included general nutrition topics (e.g., 5 a day, sugar content beverages, basics on food labels, daily physical activity to reduce chronic disease risk). Food models were also utilized during the nutrition education session (e.g., reading labels for sodium, fiber, fat). An educational handout was developed and translated for the sessions and was available in the major languages in which the sessions were conducted (e.g., English, Spanish, French, Arabic, Vietnamese, Burmese; see Appendix B).

### **Obtaining Consent**

After the initial nutrition education session, the parents received a translated flyer regarding the study (see Appendix C). A description of the study was then provided orally (interpreted into the primary language of the families, Appendix D). Parents were not asked directly to provide individual consent, however, they were informed any verbal feedback or physical feedback (i.e., raising their hand) during the data collection period would be written down for use in the research study. This method of consent was chosen and approved with the intention to alleviate potential peer pressure or burden on parents to participate within the group setting. Parents were also offered an opportunity to ask questions after data were collected and were informed that at this point their questions would not be written down as any part of the research study. After the parents received the study flyer and the script was read and interpreted, questions were initiated. All group discussion questions were interpreted.

## **Data Collection**

For questions 5–10 parents were asked to show their interest by raising their hands. Research assistants ( $n=3$ ) tallied the hands raised per topic and took notes during this open-ended data collection. For questions 3–4 notes were taken by the primary investigator and research assistant from these more open-ended questions regarding dietary changes and concerns upon arrival to the U.S. Questions 1 and 2 were discarded due to time constraints. No audio recording was utilized during data collection to reduce any stress or barriers to participation for the parents.

## **Data Analysis**

After the data collection, research assistants ( $n=3$ ) met with the primary investigator to reach consensus on data collected and on topics initiated by parents. A summary was prepared based on the feedback and consensus between research assistants and the primary investigator. Data were organized by the total number of “parents present in the sessions” rather than “sample size” due to the consent process and inability to define the exact sample number per group session. Themes were identified using deductive content analysis as outlined by Elo and Kyngäs.<sup>45</sup>

## **Results**

Caregivers were organized by language as the data were collected during sessions organized by language. Language groups included French, Spanish, Vietnamese, English, and Arabic speaking parents and caregivers (see Table 3.1) and for a total of  $N=38$  caregivers.



Table 3.1

Demographic Information of Newcomer Caregivers ( $N=38$ )

Language Group	<i>n</i>
Spanish	14
French/English	11
Vietnamese*	3
Arabic*	10

*Note.* Vietnamese speaking and Arabic speaking parents were grouped together during sessions

The most popular nutrition education topics identified (listed from highest to lowest interest) included (a) attending a nutrition education session in their community in the future, (b) assistance and education using food labels and tasting new recipes with American/local ingredients, and (c) information regarding diets to reduce risk of chronic disease (see Table 3.2). The least popular nutrition education and activities and topics included participating in an assisted “shopping” tour as well as information regarding children’s growth and nutrition.

Although parents did not report a high interest regarding children’s nutrition related to growth and development, they did report a variety of concerns regarding the diets of their children upon arrival to the U.S. (Table 3.3). Sugar and soda consumption were regularly reported along with concerns of children’s preferences and intake of “fast food” items like hamburgers and pizza. A variety of concerns were described regarding fruits and vegetables ranging from the cost barriers, frustration with their children’s lack of consumption as well as the lack of fruits and vegetables in school meals. Children’s dislike for whole grain products was also described. Frustration with a lack of healthy

options provided in restaurants was consistently indicated. Nutrition related chronic disease concerns (e.g., blood pressure, blood lipid levels) were also mentioned independently by the Arabic/Vietnamese speaking group as well as the French/English group but not in either Spanish speaking session (which were also the largest groups).

Table 3.2

Newcomer Caregiver's Interest in Nutrition Education Topics by Language

Group/Session

Nutrition Education Topic	Number Responding "Yes"			Total
	Arabic/ Vietnamese (n=13)	Spanish (n=14)	French/ English (n=11)	
Interested in attending Nutrition Education in Community in the future?	10	12	9	31
Interest in information/assistance in using food labels to make healthy food choices	10	13	7	30
Tasting new foods/recipes with healthy American foods	10	13	7	30
Diets to reduce risk of chronic disease (i.e., high blood pressure, diabetes, weight gain, heart disease)	9	13	7	29
Foods important for child's growth and development	6	13	7	26
Shopping companion to help navigate American products and/or American grocery stores	8	6	8	20

Table 3.3

## Nutrition and Health Concerns of Newcomer Parents

Arabic/Vietnamese ( <i>n</i> =13)	Spanish ( <i>n</i> =14)	French/English ( <i>n</i> =11)
<ul style="list-style-type: none"> <li>• Reduced sugar options for soda</li> <li>• Parent's cholesterol (blood levels)</li> </ul>	<ul style="list-style-type: none"> <li>• Concerned about child's eating habits: junk/fast food, desire more natural foods</li> <li>• Concerned about pizza and hamburgers served at school</li> <li>• Concerns regarding affordability of produce (fruits/vegetables)</li> <li>• Concern about sodas</li> <li>• Lack of healthy options in restaurants</li> <li>• Concerns getting kids/child to eat fruits and vegetables</li> <li>• Kids do not like whole grain products</li> </ul>	<ul style="list-style-type: none"> <li>• Information requested for foods good for vision, Vitamin A</li> <li>• Parent's sodium levels and blood pressure</li> <li>• School lunch (concerned child needs more fruit/vegetables)</li> <li>• Parent's dairy/milk intolerance concerns</li> <li>• Desired for their children to see sugar content of sodas</li> </ul>

### Discussion

The objectives of this study were to (a) examine the dietary perceptions, behaviors and/or concerns of newcomer caregivers with upon arrival to the U.S., and (b) examine the interests of newcomer caregivers regarding a variety of nutrition topics and/or educational opportunities. Results indicate common concerns and interests despite the wide range of cultures, languages, backgrounds, and experiences represented. To the knowledge of the authors this study is unique in the diversity of the participants as well as in the short length of time of residence with which the study was conducted (the school

serves newcomer students and families within their first year in the U.S.). This study adds to the literature that has reported elevated nutrition and health risks with newcomer groups by examining individual interests in topics and activities that have demonstrated to play a role in risk (e.g., navigating stores and food insecurity, diet-related chronic disease).

The highest ranked topic of interest for the families included attending future nutrition education sessions within their communities. This interest in participating in additional nutrition education is promising for future interventions with new arrivals. Community-based nutrition education and health promotion is strongly suggested by Rondinelli et al. in a study exploring the perceptions of former refugees and service providers, and early intervention to promote incorporation of healthier foods in the diet (or maintenance of healthy traditional foods) has been suggested by Pereira et al. due to the rapid change and stabilization of food habits by newcomers in the first 12 months after arrival.<sup>6,25</sup> In addition, Peterman et al. suggest that organizations that serve newcomers should “strategically devote resources to ensure successful early transition to the U.S. food environment and long-term food security.”<sup>21</sup> The strong suggestion of early intervention and interest of caregivers for future nutrition education should be examined for the potential to reduce negative dietary changes and chronic disease burden in groups.

Results of this study suggest strong interest in nutrition education and health promotion and in addition to this interest to participate in more nutrition education, caregivers provided feedback to the specific topics and/or activities in which they would like to participate. Caregivers were very interested in taste testing new recipes with local

ingredients. Hadley et al. found African refugees reported high levels of difficulty cooking American foods (63%,  $n=281$  refugees) and Patil et al. found a high interest in learning how to cook American foods with Liberian refugees (especially foods preferred by their children).<sup>7,10</sup> In a study with Latino parents by Flores et al., parents enjoyed taste testing recipes (especially cultural recipes that were modified to improve the nutritional quality).<sup>38</sup> Due to the previously reported rapid dietary acculturation of newcomer children and youth, it may be beneficial to provide parents with opportunities to learn healthier versions of “American favorites.” Recipes that focus on quick and convenient meals may also support long-term diet quality and combat the incorporation of less healthy foods and fast foods which have been reported to increase as gender roles (e.g., women working more) and lifestyles shift in America (e.g., less time available to prepare family meals).<sup>5,7,23,24,26,30,46</sup>

In addition to interest obtaining recipes and taste testing, parents also reported a strong interest in learning more about how to use food labels. Nutrition education needs regarding food label use has also been identified in other studies. For example, in a study by Sharif et al., only 13% of Hispanic participants survey demonstrated adequate comprehension of the food label and only 60% used it.<sup>46</sup> In a study of the general population in Canada, approximately one-third did not adequately understand the food label.<sup>47</sup> Food label use is important as it has been associated with improved food choices and higher diet quality (e.g., less total calories, fat, improved fiber); however, there has also been evidence that a sufficient amount of nutrition knowledge is necessary in combination to food label use.<sup>48-50</sup> For example, in another study with Hispanics,

nutrition label usage rarely or never influenced purchases when nutrition knowledge was limited.<sup>51</sup> A base of general nutrition knowledge appears to be required in order to best utilize the food label to support healthy, more nutrient dense food choices. Future nutrition education should include basic nutrition education and improvement of nutrition knowledge in addition to knowledge and skills utilizing the food label. Improving knowledge and use of food labels (e.g., reducing sodium, saturated fat, sugar) may be especially promising in light of reported concerns for a variety of health related chronic conditions in this study (and the literature).<sup>23-26</sup>

In addition to reported interest in nutrition education relating to chronic disease, caregivers also brought up specific nutrition-related chronic disease concerns during the open-ended discussion questions including sodium intake and blood pressure as well as cholesterol levels and diet. Research examining health literacy regarding prevalent chronic diseases (e.g., diabetes, hypertension) is limited as are interventions to reduce chronic disease burden with these groups despite reported risks. Understanding health literacy as well as cultural, language, and literacy needs and barriers with these groups is key to addressing these disparities and developing targeted, tailored health promotion strategies and messages. Some very basic resources (e.g., translated handouts by the U.S. Committee for Refugee and Immigrants) exist for health care and service providers; however, these resources are not targeted or tailored to individual groups.<sup>52</sup> Tailored and targeted resources have been found to be more successful in improving nutrition knowledge and in supporting healthy behaviors (e.g., food choices, diet quality).<sup>53-56</sup>

In contrast from nutrition concerns by the adults themselves, there was less interest in nutrition related to children's growth and development; however, there was concern about the dietary choices that their children were making, particularly with regards to fast food types of items (e.g., pizza, hamburgers) and the lack of fruits and vegetables they perceived available instead for their children at school. There was also little reported interest in receiving assistance navigating grocery stores and food products. Difficulty navigating stores and products in the U.S. has been found to be significantly linked to food insecurity.<sup>10,12,21</sup> Some difficulties navigating the U.S. food system may be in part due to lack of prior experience for some groups. For example, in a study by Dharod with South-Asian refugees, 97% of the women surveyed reported they did not ever shop in a store for food prior to arrival (having grown and traded for most of their food staples).<sup>25</sup> In addition, in a preliminary study volunteers and service providers to local refugee groups indicated that assistance navigating grocery stores is an area of strong need.<sup>57</sup> Hands-on assistance shopping, however, was the least appealing education or training opportunity for caregivers in this study.

This study examined the interest in a variety of nutrition topics and activities that have been associated with nutritional risk for newcomer families (e.g., difficulty navigating products, stores, and chronic disease risk). While many studies have focused on identifying risk factors in newcomer groups, few studies have investigated the interest regarding related education topics and learning activities to address these risks. Despite these new and unique findings, there are several limitations to this study. The lack of sociodemographic information due to time constraints and invasiveness reduces the

context with which the data can be analyzed and interpreted. Although all families whose children attend the school were invited to attend, it is possible more acculturated or higher educated parents may have self-selected to attend to gain information and this could influence the results. The nutrition education sessions prior to the data collection may have encouraged interest in particular topics or nutrition and health overall. The interest in topics and activities did not differentiate between levels of interest (e.g., very interested, to somewhat interested) rather parents indicated interest vs. no interest (e.g., yes vs. no). Lastly, data were collected by note taking, which is not as preferable as audio recording and transcribing sessions; however, the decision to not audio-record was chosen to improve the comfort level of the families in participating in the study. Despite this, several limitations measures were employed to reduce bias and inaccuracies in the data collection and analysis (e.g., multiple members of the research group reached consensus on topics initiated by parents during the open-ended discussion).

In summary, this study demonstrated high interest in receiving education in many areas of nutrition and related health topics. This work suggests newcomers desire nutrition education regarding recipes and taste testing and food label support, as well as information regarding diet-related chronic diseases. Future interventions may focus on promoting diet quality with taste testing and healthy recipe ideas, particularly to provide resources to parents who are frustrated with fast food preferences of their children and who wish to incorporate more fruits and vegetables. In addition, the adoption of convenience and fast foods due to limitations in food preparation time in the rapidly adopted American lifestyle warrants support of families to provide recipes that are quick



and simple as well as how to choose healthier convenience and fast food options.

Culturally relevant and appropriate education and interventions focusing on chronic disease prevention and reduction are also an area for potential future research.

Examination of the efficacy of early interventions with newcomers in addressing their interests and risk factors and the long term impact on diet quality, nutrition security, and/or chronic disease risk should also be evaluated. Lastly, although groups share many common interests and concerns, future nutrition education or health promoting interventions or resources should be tailored and targeted to individual cultural groups to support improved outcomes.

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## CHAPTER IV

### MOVING LESS, NEW FOODS, AND GAINING WEIGHT: PERCEPTIONS, KNOWLEDGE, CONCERNS, AND INTERESTS FROM FOCUS GROUPS WITH NEWCOMER YOUTH

#### Abstract

**Introduction:** In 2012, North Carolina ranked in the top ten for refugee resettlement. Newly-arrived youth are understudied, but experience rapid dietary acculturation. These changes, in combination with household food insecurity, put them at risk for adverse long-term health outcomes. The objective of this study was to examine the nutrition perceptions, interests, and needs for newly-arrived youth.

**Methods:** A facilitated group discussion ( $n=7$ ) and semi-structured interviews ( $n=2$ ) were conducted (with French and Spanish interpretation) with high school students between May and June 2015. Countries of origin ( $n=9$ ) included Pakistan, Senegal, Niger, Liberia, Somalia, Mexico, Honduras, and Rwanda. Notes were handwritten by the principal investigator and a research assistant during focus groups, compared for accuracy, and analyzed using content analysis to identify themes.

**Results:** Students reported pre-arrival diets focused on starches, meats, and salads and the addition of new “American” favorites including pizza, hamburgers, and fried chicken. Students reported their diets to be similar to pre-arrival, with a reduction in physical activity as the greatest change. Physical activity preferences varied between genders. Female students initiated concerns with weight gain and interest in weight loss diets.



Students' perceptions of health focused on maintaining "balance," the need to be active, limiting junk food and soda, and eating fruits and vegetables.

**Conclusions:** Results from this study demonstrate a basic understanding of nutrition, negative dietary acculturation, and reductions in physical activity upon arrival. Barriers and promoters for physical activity should be further explored, particularly with evidence of negative diet changes and weight gain concerns.

### **Introduction**

In 2013, 990,553 individuals became lawful residents of the U.S.<sup>1</sup> Of these individuals 10.4% (103,191) were between 5 and 14 years of age and 16.7% (165,893) were between the ages of 14 and 24.<sup>1</sup> In addition to general immigration, 69,909 entered the U.S. as refugees and 33.8% were under the age of 18 (23,647). Individuals entering under refugee status under the Immigration and Nationality Act 101(a)(42) are "unable or unwilling to return to his or her country of nationality because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion."<sup>3</sup>

The consistent, annual immigration rates (990,553 in 2013, 1,031,632 in 2012, and 1,062,040 in 2011) are rapidly changing the ethnic makeup of the U.S.<sup>1,4</sup> The foreign-born population is estimated by the U.S. Census Bureau to grow by 85% with foreign-born individuals under the age of 18 expected to increase 29.8% between 2014 and 2060.<sup>4</sup> As the makeup of the U.S. rapidly shifts over the next few decades, the health and nutrition needs of these groups must be examined to support national, state, and local health priorities and policies (e.g., Healthy People, Dietary Guidelines) that will address

the health and nutrition needs of an increasingly ethnically and culturally diverse population. Incoming groups, particularly refugee groups, have not been well studied despite demonstrated risks. Immigrant and refugee adolescents are especially understudied despite their numbers and risks.

Newcomer youth are exposed to new foods as they attend school and dietary change is far more rapid and frequently results in family frustrations as youth rapidly adopt a variety of unhealthful foods (e.g., Sugar-sweetened beverages (SSBs), convenience and fast foods (FFs)).<sup>5-15</sup> School offers opportunities to try a new variety of foods—often fast food-like meals (e.g., pizza, hamburgers) but also milk, other sources of dairy, and local fruits and vegetables. Adoption of new foods therefore demonstrates both positive (e.g., increases in calcium) and negative dietary effects (e.g., increases in fat consumption, total calories) as well as increases in BMI and blood pressure with dietary changes.<sup>16-20</sup> Less acculturated adolescents also report higher consumption of fruits and vegetables and better overall diet quality which suggests that maintaining cultural identity and foods may be protective of diet quality.<sup>21-23</sup>

Not all newcomer groups acculturate at equal rates or with equal outcomes.<sup>23-25</sup> In a study by Allen et al., Latino and Asian youth were compared over several generations. Asian youth maintained healthy behaviors or improved regarding diet quality and physical activity, whereas Latino youth showed decreased diet quality over time (e.g., decreases in fruit and vegetables, increases in sodas).<sup>23</sup> In a study by Arcan et al., Somali, Hispanic, Hmong, and white adolescents were compared and shared trends of low fruit, vegetable, and dairy consumption but high fast food consumption, with Hispanic and

Somali teens consuming the most fast food.<sup>25</sup> Time, taste, and convenience have been described as influencing factors in increasing consumption of fast food and convenience foods in a study with Mexican, Cambodian, Sudanese, and Somalian adolescents.<sup>13</sup> In another study with Mexicans, within one generation in the U.S., influence of the traditional diet was lost, suggesting rapid change.<sup>26</sup> These studies support findings with caregivers cited previously in which parents report their children request and desire Western foods (especially fast foods), but also indicate acculturation is complex and may vary distinctly between ethnic groups and result in positive and negative dietary changes.

Adolescents of immigrant and refugee households also often play a more active role (in comparison to whites) in shopping and preparing foods for the family, and have more independence choosing or preparing their own foods.<sup>10,19,27,28</sup> Additionally, the role of adolescent newcomers as cultural brokers may increase their influence on the family diet.<sup>29</sup> Different cultures report differences in the power adolescents hold, with mixed influence reported in African homes and less influence in some Asian cultures.<sup>8,25,29</sup> Newcomer adolescents have also reported heightened sensitivity to peer pressure, social expectations, and body image. Studies with African, Southeast Asian, and Hispanics all reported attempts to modify their diet or increase physical activity in order to control their weight or “look/feel good.”<sup>10,21,25,27,29,30</sup> Generational differences in perception of weight with parents often favoring attempts to increase children’s weight, while adolescents report resistance.<sup>25,29</sup>

In summary, adolescents are exposed to a variety of new foods upon arrival to the U.S., especially as they enter the school system. Changes vary between groups and may

result in rapid healthful and/or risky dietary choices. Newcomer adolescents also demonstrate body image concerns as well as reports of dieting or increased activity to modify body weight. Literature regarding attitudes, knowledge, perceptions, and interests of newcomer adolescents is limited, despite the potential health and nutrition risks. The objective of this study was to examine nutrition and health knowledge, changes (e.g., food choices, physical activity), perceptions, and interests of newcomer adolescents.

## **Methods**

### **Study Design**

Facilitated group session and semi-structured interviews were conducted during school days between May and June 2015 at a school for newcomer youth in North Carolina.<sup>ii</sup> Sessions occurred during Physical Education (P.E.) and Health classes for middle and high school students. Questions were based on a semi-structured guide that was content validated by experts ( $n=3$ ) in the field of immigrant and refugee nutrition and health and/or family focused nutrition (see Appendix E). Questions targeted nutrition and health-related changes, concerns, and interests. The study was approved by the institutional review board at The University of North Carolina at Greensboro and the school district's Research Review Committee prior to recruitment and data collection. Written parental consent as well as written and/or oral informed student assent was obtained prior to any data collection in their primary language. An interpreter was available for assent for the students as well as to answer any questions regarding the study.

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<sup>ii</sup> This description of the school is the wording required in agreement with the school district for confidentiality purposes for research conducted within the school system.

## Site Description

The study was conducted at a school for newcomer youth in North Carolina that provides a specialized environment for students during their first year in the U.S. North Carolina ranked in the top ten in 2012 for refugee resettlement and receives high numbers of immigrants annually.<sup>8</sup> North Carolina was home to 749,426 immigrants in 2013 with 31.9% naturalized U.S. citizens with high numbers of Asian and Latin American immigrant populations.<sup>31</sup> There were approximately 350,000 unauthorized immigrants in North Carolina in 2013.<sup>31</sup> Also, there were 2,110 refugees who arrived in North Carolina in 2012, most of whom initially resettled in Charlotte, Durham, Greensboro, High Point, New Bern, and Raleigh.<sup>32</sup> The largest refugee populations in North Carolina include the following countries or origin: Myanmar, Bhutan, Iraq, Cuba, Eritrea, Democratic Republic of the Congo, and the Sudan.<sup>32</sup>

To meet the needs of a very diverse student population the school employs part-time and fulltime onsite bilingual community liaisons who help school staff communicate with students and families. The school also has an onsite fulltime social worker in addition to a guidance counselor. The school provides initial placement testing and instruction that meets grade level standards, in addition to opportunity for specialized instructions regarding educational procedures and culture in the U.S. The school also coordinates efforts with the local health (e.g., County Health Department, local pediatric community clinics) and social service organizations for support of students and families (e.g., immunization requirements, clothing, medical, and dental needs).

**Recruitment and Inclusion Criteria**

All students in P.E. and Health classes between the ages of 12 and 17 who spoke English, Spanish, Arabic, French, Vietnamese, or Burmese were provided with a recruitment packet that included a study flyer as well as two parent consent forms (see Appendixes F, G, and H). These languages were chosen based on the current populations at the school as well as the availability of staff for translation of study materials and interpretation. Packets were distributed by the P.E. and Health teachers at the school. The packets were collected on a regular basis over a four-week period. Students who returned packets with parental consent were given the opportunity to participate in the focus groups and/or a survey given at the school. The school system and school suggested inclusion of students more proficient in English to ease the burden on the school's community liaisons (interpreters). The final focus groups were selected based on English proficiency and/or Spanish/French, as additional Spanish and French translators (non-school staff) were recruited and available for sessions, allowing for expansion of inclusion criteria without burdening of school staff. Students in the final focus groups were invited to participate based on English, French, and/or Spanish proficiency.

**Confidentiality, Translation, and Interpretation Services**

Community liaisons employed by the school and two non-school staff interpreters (Spanish and French) were trained by the principal investigator regarding confidentiality and the scope of the research project within IRB requirements of The University of North Carolina for community partners assisting with interpretation and translation. Each Community Liaison and interpreter provided written consent acknowledging their

commitment and understanding of confidentiality of the students and data, as well as their independent choice to participate in this research study prior to any translation and/or interpretation. The community liaisons translated all written materials used for this study (e.g., see Appendixes F, G, and H) with the exception of French, which was translated by an international student from The University of North Carolina at Greensboro.

Interpretation during sessions was provided by a bilingual Spanish community member and a French-speaking community member who were trained by the principal investigator regarding confidentiality and the scope of the research project within IRB requirements of The University of North Carolina at Greensboro for community partners assisting with interpretation and translation.

### **Facilitation Group Sessions**

The group session and semi-structured interviews were held during P.E. and Health class time in an unused classroom. Each session lasted approximately 45 minutes. A Spanish interpreter was available for the first session (group discussion) and a French interpreter was available to assist with the second session (semi-structured interview). Students were lead through the session based on the guide which began with general icebreakers (e.g., “a) *Let’s start of by introducing ourselves, by name, where you are from, and something about you, what you like to do, or something that is important to you, b) Now let’s go around and share one of your favorite foods*”; see Appendix E). Students were provided the option to be skipped or to not participate in responding to any of the questions with which they were uncomfortable.

## **Data Collection and Analysis**

The principal investigator and a research assistant took handwritten notes throughout the sessions. No audio recording was utilized during data collection to reduce any stress or barriers to participation for the participants. After each session, the primary investigator and research assistant met to compare notes and reach consensus on themes. Themes were organized in categories by question topics. Data were analyzed for themes using content analysis as described by Elo and Kyngäs and was listed in order of decreasing frequency of how the consistency with which the topic was initiated or agreed upon by students.<sup>33</sup>

## **Results**

The facilitated group discussion ( $n=7$ ) and semi-structured interview ( $n=2$ ) included students of both genders ( $n=6$  females,  $n=3$  males) and a total of eight nationalities were represented (see Table 4.1). The facilitated group discussion included the greatest variety of nationalities and included a Spanish interpreter. The semi-structured interviews included a brother and sister pair from Senegal who spoke English and French and a French interpreter was present. Both sessions utilized the same discussion guide (see Appendix E).

The sessions opened with ice-breaker questions regarding hobbies and favorite foods and then a general discussion of health and health related behaviors (see Table 4.2). Health status was related to “feeling good, limiting junk food” and staying active. Health was also dependent upon a concept of balance (e.g., “a little bit of everything, not too much”). Physical activity was the most frequently reported behavior to support good



health. After physical activity, vegetable, fruit, and milk consumption were identified to support good health. Consumption of soda, oil, salt, and sugar were directly identified as foods that made you less healthy. Food safety concerns were also brought up by students (e.g., importance of washing your hands/food, concerns of food at school because they were uncertain how long it had been sitting out).

Table 4.1

## Adolescent Group Demographics by Session Type

Demographic	Session Type	
	Facilitated Group Discussion	Semi-structured Interviews
Sample Size	<i>n</i> =7	<i>n</i> =2
Gender		
Male	<i>n</i> =2	<i>n</i> =1
Female	<i>n</i> =5	<i>n</i> =1
Nationalities Represented	Pakistan, Niger, Liberia, Somalia, Mexico, Honduras, Rwanda	Senegal

Table 4.2

## Adolescent Health Themes

Discussion Topic	Themes
What does it mean to be healthy?	<ul style="list-style-type: none"> <li>• “a little bit of everything, not too much, exercise, eating variety, still eat junk not too much”</li> <li>• Not too much junk</li> <li>• Active (being active)</li> <li>• “feel good”</li> </ul>
What makes you healthy?	<ul style="list-style-type: none"> <li>• Active (being active)</li> <li>• Eating Vegetables</li> </ul>
What can you do to be healthy?	<ul style="list-style-type: none"> <li>• Eating fruit</li> <li>• Milk</li> </ul>

Table 4.2

Cont.

Discussion Topic	Themes <sup>§</sup>
What makes you less healthy?	<ul style="list-style-type: none"> <li>• Soda</li> <li>• Not washing hands/not washing food</li> <li>• Too much oil, salt, sugar,</li> </ul>

<sup>§</sup> Themes listed in order of decreasing frequency

Discussion of students' diets and physical activity revealed many trends, perceptions, and behaviors (see Table 4.3). Chicken and rice were consistently reported as a favorite Pre-U.S. meal as well as salads. Sandwiches and hamburgers were also described as favorite Pre-U.S. foods. New favorite foods in the U.S. included energy dense, fast food-type foods with pizza as the first choice followed by hamburgers, fried chicken, and high-calorie beverages (e.g., milkshakes, frappes, sodas).

When asked about any nutrition concerns, all concerns were weight related, including concerns with weight gain, interest in diets to lose weight, as well as reported changes in weight. Students perceived changes to their weight, but did not believe their diets had changed upon arrival to the U.S. (see Table 4.3). Only female students brought up weight concerns. In the first focus group session, the girls discussed weight concerns and in the second focus group session the sibling of the female student initiated the topic by describing his sister's weight-related concerns.

Table 4.3

## Adolescent Diet Themes

Discussion Topic	Themes <sup>§</sup>
Favorite foods before coming to the U.S.?	Rice, chicken/meat, salad, sandwich/hamburger
Favorite foods now in the U.S.?	Pizza, hamburger, fried chicken, high calorie beverages (milkshake, frappe, sodas)
Foods or celebrations with special meaning?	<ul style="list-style-type: none"> <li>• Feast breaking Ramadan</li> <li>• Avoidance of pork</li> <li>• Llama (Senegal) consumed on special occasions</li> </ul>
Any nutrition concerns or topics you would like more information about?	<ul style="list-style-type: none"> <li>• Concerns with gaining weight<sup>*</sup></li> <li>• Diets to lose weight<sup>*</sup></li> <li>• Concerns that eating same amount of food as before but now gaining weight<sup>*</sup></li> </ul>

<sup>§</sup> Themes listed in order of decreasing frequency

<sup>\*</sup> All concerns related to weight were reported by female students (i.e., gaining, needing to lose weight, diets to lose weight)

Students perceived their current diet as similar to their pre-arrival diet; however, their level of physical activity was consistently described as having experienced the most change (physical activity was reported to have decreased among all genders; see Table 4.4). Physical activity preferences varied by gender with males reporting preference for futbol (soccer) and females reporting a preference for basketball. Students described the variety of ways they were physically active in their home countries and how this had changed upon arrival to the U.S. Prior to arriving to the U.S., students reported they had more opportunities to walk in their daily lives (e.g., walking to school, visiting others), as

well as in games or sports they did not have the same access to in the U.S. (e.g., cricket, badminton, swimming).

Table 4.4

Adolescent Physical Activity Themes

Discussion Topic	Themes <sup>§</sup>
What are some of the biggest changes/differences with your diet/activity level in the U.S.? Why do you think this is?	<ul style="list-style-type: none"> <li>• Less active, less walking (used to walk more)</li> <li>• Diet perceived as similar in U.S. to before arrival</li> <li>• Produce perceived to have less taste, milk similar in taste</li> <li>• Dislike for “mixed” dishes (casseroles)</li> </ul>
Activity Preferences	<ul style="list-style-type: none"> <li>• Soccer/futbol (males)</li> <li>• Basketball (females)</li> </ul>
Pre-Arrival to U.S. Activities (students reported they no longer had access to these activities)	<ul style="list-style-type: none"> <li>• Cricket</li> <li>• Badminton</li> <li>• Swimming</li> <li>• “Games”*</li> </ul>

<sup>§</sup> Themes listed in order of decreasing frequency

\* Students described a variety of outside games, many using a ball (but they couldn’t remember the name or provide a name in English)

## Discussion

The objective of this study was to examine nutrition and health knowledge, changes (e.g., food choices, physical activity), perceptions, and interests of newcomer youth. A unique characteristic of this study, as far as the authors are aware, is the short timeline the participants had resided in the U.S. and the diversity (nationality/ethnicity) of the study population (students who attend the Newcomer’s School have been in the U.S. for less than a year, with some only a few weeks/months). Few studies have investigated diet

and physical activity so close to arrival. Within this short timeline, newcomer adolescents already report many changes to their physical activity and diet. The consistency of identified themes within a diverse group of students suggests some commonality in the experiences as they arrive and transition to life in the U.S.

Sessions revealed students defined their health as “how you feel” and incorporated a concept of “balance” supported by physical activity, limiting junk foods, and eating fruits and vegetables. Students reported that sugar, oil/fat, salt, and soda would negatively impact their health. Kim et al. found Hmong youth related physical activity and consumption of fruits and vegetables as supportive of good health.<sup>29</sup> Physical activity was the behavior most frequently identified with supporting good health, and it was also the behavior most perceived to have changed upon arrival to the U.S. Students reported reductions in their physical activity and lack of access to the types of activities in which they participated prior to arrival (e.g., cricket, swimming).

Several other studies with newcomer youth have found reported decreases in physical activity in the U.S.;<sup>8,27,29,35</sup> however, Allen et al. (in a comparison of first-through third-generation Hispanic and Asian youth) found physical activity was perceived to increase over time. Reductions in physical activity have most frequently been associated with changes to daily lifestyle (e.g., no longer walking to school and friends’ homes, less physically demanding chores) as well as less safe space and time.<sup>8,29,35,36</sup> Results from this study support previous findings that physical activity is reduced upon arrival to the U.S. due to a variety of factors.

While physical activity was identified most consistently as the greatest “change,” students did report many new favorite foods in the U.S. which now include many fast foods such as pizza, hamburgers, and fried chicken. Students reported many new foods they enjoy and had incorporated into their diets while also reporting their diet had experienced little change upon arrival. It is possible that students are maintaining traditional foods at home and incorporating new foods at school; therefore, they do not perceive a change to their diet (or at least to their traditional diet). In a study by Renzaho et al., newcomer African youth in Australia reported they still consumed their traditional diets while their parents reported they were rapidly acculturating to a westernized diet; therefore, perception of dietary acculturation may likely vary between generations and may not be accurately portrayed. This study provides evidence that dietary acculturation may be difficult to measure with newcomer students and that more quantitative methods may be preferable to identify specific changes to the frequency of consumption of food groups as well as the transition to a westernized diet and the incorporation of non-traditional foods.

Favorite new foods in the U.S. did not include any fruits or vegetables, but focused on fast food-like items (e.g., pizza, fried chicken). Incorporation and increased consumption of fast foods and convenience foods by newcomer youth has been reported in other studies.<sup>8,10,35,37</sup> For example, in a study by Arcan et al., fast food consumption was found to be equal or higher between Somali, Hispanic, and Hmong than white adolescents, with significant differences between groups; Somali and Hispanic students consumed the most fast food (approximately double the intake in comparison to whites).

In addition, in a study by Stang et al., Hmong adolescents were found to have comparable fast food consumption behaviors to white students. Fast food consumption may also be associated with poor health outcomes, as demonstrated by a study by Hsieh et al., in which proximity to fast food restaurants was significantly associated with insulin resistance in Hispanic youth.<sup>38</sup> Acculturate Studies have reported decreases in dietary quality and increases in weight and other related concerns as diets change.<sup>16,20,21</sup> A study by Smith and Franzen-Castle revealed that over time in the U.S., BMI was found to increase and correlate with increases in blood pressure in Hmong youth.<sup>18</sup>

Although not all studies have measured weight or BMI status of newcomer adolescents, many studies have examined weight-related concerns of newcomer adolescents and found strong concerns about weight gain, body dissatisfaction, and a variety of behaviors to reduce weight (e.g., including restrictions of portions, disordered eating, increasing physical activity, etc.).<sup>8,25,27,30,36</sup> These findings are supported by results in this study which found concerns regarding weight gain. Interestingly, only female students reported concerns regarding their weight and interest in losing weight and dieting. In a study by Lopez et al., female Hispanic adolescents were more likely than males to report disordered eating patterns.<sup>39</sup> In addition, some studies have identified generational differences in weight perception with parents preferring weight gain (as a sign of social status and health), whereas other studies have found parents to have concerns about their children's weight gain and attempts to help their children lose weight.<sup>8,10,30</sup> These contradicting trends have been reported in both Hmong and African families.

Differences in body image and dieting behaviors have also been reported between groups and genders with newcomers. In a study by Arcan et al., adolescents of both genders were similar in body satisfaction; however, female adolescents reported being more likely to diet to lose weight and participate in unhealthy weight control behaviors. Hmong female and male adolescents in comparison to Hispanic, white, and Somali adolescents were more likely to report dieting and unhealthy weight control behaviors, and Somali girls had much higher rates of dieting and unhealthy weight control behaviors in comparison to white and Hispanic students. In a study by Stang et al., Hmong male and female adolescents were more likely than white adolescents to report dieting, weight concerns, and extreme unhealthful weight control. Results from this study and others suggest greater body dissatisfaction and weight control behaviors in newcomer adolescents, particularly girls. Furthermore, other studies used direct survey questions regarding weight concerns, body image, and dieting behaviors, and in contrast during this study, topics were initiated by girls without prompting, which may further reinforce the concerns of adolescents (particularly girls) regarding body image and weight. It is also unknown if body dissatisfaction develops upon arrival and exposure to U.S. culture; thus, perceptions should be further explored.

In the Project EAT study by Neumark-Sztainer et al., a diverse group of adolescents consistently identified a variety of weight-related concerns, risky weight management behaviors, and poor body image in both genders.<sup>40</sup> In a longitudinal follow-up Project EAT-II study, dieting behaviors with adolescents were significantly associated with skipping breakfast (females) and binge eating (males and females), as well as



decreases in physical activity (males) and increases in BMI over time (males and females).<sup>41</sup> The long-term effects of poor body image and dieting behaviors may be associated with increased health risk (BMI, reductions in physical activity) and should be further examined and may require incorporation of interdisciplinary experts (e.g., psychology, counseling).

Although there are many findings worth further exploration, there are also limitations to this study. Students were identified by language proficiency in English; therefore, students may have been included who were more acculturated. In addition, no Arabic, Vietnamese, or Burmese translators were available for focus groups which deterred participation by adolescents of several nationalities (other studies have reported many body image and dieting issues with Southeast Asian youth, e.g., Hmong; however, no Southeast Asian students were able to be included in these focus groups). Both genders were also not equally represented; therefore, the stark contrast in reported weight concerns may have been different if more male students had participated (especially as other studies have found weight concerns with males). In addition, focus groups were conducted with both genders present and results may have varied if it had been possible to separate male and female students. It is also noteworthy that over time, more changes (both positive and negative) to behaviors may occur and that results identified in this study may worsen or improve.

Although limitations exist, this study is unique in that very newly-arrived students participated and involved a more diverse student population than other studies. This study identified trends in weight concerns, dietary acculturation, and a reduction of physical

activity also reported in other studies with newcomer youth. Results from this study and others demonstrate a strong risk for poor health outcomes due to the poor changes to the diet and reduction of physical activity. Future work should further clarify specific changes to diet and physical activity including assessment of pre-arrival trends and an exploration of influencing factors on dietary and lifestyle changes. Furthermore, many groups remain poorly understood and trends and differences between nationalities, cultures, and ethnic groups should be further explored in order to develop targeted, relevant nutrition and health-promoting resources and interventions.

In addition, research and interventions should explore improving access to physical activity and support positive dietary changes that may help to maintain healthy weight and alleviate body and weight dissatisfaction. Work with schools to improve nutrition education, healthy body image support, cooking, and physical activity opportunities would likely benefit all adolescents in the U.S. and may have the potential to reduce long-term chronic disease burden.

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## CHAPTER V

### NUTRITION AND PHYSICAL ACTIVITY CHANGES, PERCEPTIONS, CONCERNS AND INTERESTS WITH A DIVERSE GROUP OF NEWCOMER YOUTH

#### Abstract

**Introduction:** North Carolina ranks in the top ten nationally in refugee resettlement with a central county one of the most diverse in the southeast. Newcomer youth are understudied but have demonstrated rapid, negative acculturation. The objective of this study was to explore diet, physical activity, and health perceptions, changes, and interests of newcomer youth.

**Methods:** Participants ( $n=67$ ) ages 12–17 were included who spoke English, Spanish, French, Vietnamese, Burmese and/or Arabic. Paper and pencil surveys were translated and read orally to students. Heights and weights were taken to calculate BMI. Data analysis was conducted utilizing SPSS 20.0 and included frequency and bivariate analysis. Dietary acculturation scores were calculated on a 9-point scale based on reported intake of new, nontraditional foods upon arrival to the U.S.

**Results:** 31.5% of the students were overweight/obese. Of all the students, 45.8% reported they believed their weight was “good” and 46.8% had tried to lose weight and 36.1% had tried to gain weight. Dietary acculturation scores varied by region (7.0 Central America vs. 3.0 Middle East). An ANOVA comparison revealed that dietary acculturation scores were marginally associated with BMI ( $p=0.057$ ). Some food trends



increased upon arrival (e.g., fruit and fruit juice, 1-2x/day to 3x/day; soda, rarely to 1-2x/day; and salty snacks, 1-2x/week to 1-2x/day). Reported frequencies for vegetables, milk, meat, and legumes/beans/nuts remained consistent. With regard to consumption, traditional vs. American foods 33.2% reported only traditional foods and 22.7% mostly traditional foods. Over 85% (85.3%) had tried four or more new foods. The largest factors influencing food choices included health (70.1%), taste (55.2%), religion (45.3%), and convenience (44.6%). The lowest influences on food choices included TV (6.1%) and friends (10.6%). ANOVA analysis revealed significant relationships between dietary acculturation and the value of convenience ( $p=0.003$ ) and observing Americans eat foods ( $p=0.030$ ). Students reported they wished to be more physically active (84.8%), they would like the opportunity to play more sports (84.7%), and that physical activity influenced their health (83.1%). In contrast, 41.5% believed diet influenced health, 62.5% believed their diet could be healthier, and 56.7% believed they were healthy.

**Conclusions:** Students more heavily associate the benefits of physical activity with their health than diet and would like the opportunity to play more sports. Dietary acculturation is rapid and influenced by many factors. Overweight and obesity rates are concerning and students report attempts to gain and lose weight.

### Introduction

In 2013, 990,553 individuals became lawful residents in the U.S.<sup>1</sup> Of these individuals, 10.4% (103,191) were between 5 and 14 years of age and 16.7% (165,893) were between the ages of 14 and 24.<sup>1</sup> In addition to general immigration, 69,909 entered the U.S. as refugees and 33.8% were under the age of 18 (23,647).<sup>2</sup> Individuals entering

the U.S. under refugee status, by the Immigration and Nationality Act 101(a)(42), must be “unable or unwilling to return to his or her country of nationality because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion.”<sup>3</sup>

In addition to consistent, annual immigration rates (990,553 in 2013, 1,031,632 in 2012, and 1,062,040 in 2011), the ethnic makeup of the U.S. is projected by the Census Bureau to rapidly change between 2014 and 2060 with immigration strongly impacting these expected changes.<sup>1,4</sup> The foreign-born population is estimated to grow by 85% and foreign-born under 18 years of age is expected to increase by 29.8% between 2014 and 2060.<sup>4</sup> As the makeup of the U.S. rapidly shifts over the next few decades, the health and nutrition needs of these groups must be examined to support national, state, and local health priorities and policies (e.g., Healthy People, Dietary Guidelines) that will address the health and nutrition needs of an increasingly ethnically and culturally diverse population. Incoming groups, particularly refugee groups, have not been well studied despite demonstrated risks. Immigrant and refugee youth are especially understudied despite their numbers.

Large generational disparities in dietary acculturation have been regularly reported and frequently result in family tensions.<sup>5-15</sup> A paradox appears to be occurring as older generations attempt to maintain their traditional diets while youth rapidly adopt a variety of unhealthful food behaviors (e.g., Sugar-sweetened beverages (SSB), convenience and fast foods (FF)). Newcomer youth are quickly exposed to many new foods as they attend school. School offers a new variety of foods—often convenience

foods, but also milk, other sources of dairy, and local fruits and vegetables. As previously cited, youth accept Western foods at faster rates. Improved nutrient status with adoption of some foods (i.e., calcium found in dairy products) has been associated with increased acculturation; however, increases in fat consumption, total calories, increases in BMI, and adverse effects on blood pressure have also been reported.<sup>16-20</sup> Less acculturated newcomer youth report higher consumption of fruits and vegetables and diet quality.<sup>21-23</sup> Not all ethnic groups acculturate at equal rates or with equal outcomes.<sup>23-25</sup>

In a study by Allen et al., Latino and Asian youth were compared over several generations. Asian youth either maintained health behaviors or improved regarding diet quality and physical activity, whereas Latino youth showed decreased diet quality over time (e.g., decreases in fruit and vegetables, increases in sodas) but an increase in physical activity.<sup>23</sup> In a study by Arcan et al., Somali, Hispanic, Hmong, and white adolescents were compared and shared diet trends low in fruits, vegetables, and dairy and high fast food consumption, with Hispanic and Somali teens consuming the most fast food.<sup>25</sup> Time, taste, and convenience have been described as influencing factors in increasing consumption of fast food and convenience foods in a study with Mexican, Cambodian, Sudanese, and Somalian adolescents.<sup>13</sup> In another study with Mexicans, within one generation in the U.S., influence of the traditional diet was lost, suggesting rapid change.<sup>26</sup> These studies support findings from studies with caregivers, cited previously, in which parents report their children request and desire Western foods, yet also indicating that acculturation is complex and may vary distinctly between ethnic groups and may result in positive and negative dietary changes.

Adolescents play a more active role in shopping and preparing foods for the family, and have more independence choosing or preparing their own foods, with newcomer youth reporting more participation in food selection and preparation.<sup>10,19,27,28</sup> Additionally, the role of adolescent newcomers as cultural brokers may increase their influence on the family diet.<sup>29</sup> Different cultures report differences in the power adolescents hold, with mixed influence reported in African homes and less influence in some Asian cultures.<sup>8,25,29,30</sup> Adolescents demonstrate heightened sensitivity to peer pressure, social expectations, and body image. Studies with African, Southeast Asian, and Hispanic youth all report attempts to modify their diet or increase physical activity in order to control their weight or “look/feel good.”<sup>10,21,25,27,29,30</sup> Dieting in youth may occur in contrast to generational differences in perception of weight with parents reporting attempts to increase children’s weight, while youth report resistance.<sup>25,29</sup> Many adolescents report family members with chronic conditions, especially diabetes in African and Southeast Asian groups; however, weight is rarely associated as a risk factor (sugar is most commonly identified and associated with diabetes).

In summary, dietary acculturation occurs rapidly in youth, varies between ethnic groups, and may result in healthful and/or risky dietary choices and if not improved will likely lead to adverse health outcomes. Newcomer adolescents play a role in shopping and preparing food and also demonstrate body image concerns as well as reports of dieting or increased activity to modify body weight. Literature regarding attitudes, knowledge, perceptions, and interests of newcomer adolescents is limited despite the potential health and nutrition risks associated with acculturation as “new” foods are often

convenience and fast foods. The objective of this study was to examine nutrition and health knowledge, changes (e.g., food choices, physical activity), perceptions, and interests of newcomer youth.

## **Methods**

### **Study Design**

Surveys were conducted between April and May of 2015 during high school and middle school Physical Education (P.E.), Health, and Art classes at a school for newcomer youth in North Carolina. Written parental consent was obtained in the primary language via recruitment packets sent home through the P.E., Health, and Art classes as well as written and/or oral informed student assent in their primary language prior to any data collection. An interpreter was available to students to answer any questions as well as assist in obtaining oral and/or written assent. Anthropometric measurements (height/weight) were also obtained for each student. The study was approved by the institutional review board at The University of North Carolina at Greensboro and the school district's Research Review Committee prior to recruitment and data collection.<sup>iii</sup>

### **Survey Development**

The survey was developed specifically for this study and was content validated by experts ( $n=3$ ) in the field of immigrant and refugee nutrition and health and/or family-focused nutrition (see Appendix I). Survey sections included specific questions regarding (a) sociodemographic information; (b) dietary intake trends pre-/post-arrival to the U.S. for fruits, vegetables, fruit juice, milk, soda, meat, non-meat proteins (e.g., legumes,

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<sup>iii</sup> This description of the school is the wording required in agreement with the school district for confidentiality purposes for research conducted within the school system.

nuts), salty snacks and sweets, and physical activity; (c) dietary acculturation and perceptions of U.S. foods and traditional food access; (d) home food environment (selection, influence, preparation); (e) influencing factors on diet choices (e.g., time, taste, religion, TV); (f) health literacy and nutrition/weight/physical activity concerns and needs; and (g) an open-ended section for students regarding diet and health. The survey was translated and offered in a total of six languages including English, Spanish, Arabic, French, Vietnamese, and Burmese.

### **Site Description**

The study was conducted at a school for newcomer youth in North Carolina that provides a specialized environment for students during their first year in the U.S. North Carolina ranked in the top ten in 2012 for refugee resettlement and receives high numbers of immigrants annually.<sup>8</sup> North Carolina was home to 749,426 immigrants in 2013 with 31.9% naturalized U.S. citizens including high numbers of Asian and Latin American immigrant populations.<sup>31</sup> There were approximately 350,000 unauthorized immigrants in North Carolina in 2013.<sup>32</sup> Also, there were 2,110 refugees who arrived in North Carolina in 2012 most of whom initially resettled in Charlotte, Durham, Greensboro, High Point, New Bern, and Raleigh.<sup>33</sup> The largest refugee populations in North Carolina include the following countries of origin: Myanmar, Bhutan, Iraq, Cuba, Eritrea, Democratic Republic of the Congo, and the Sudan.<sup>33</sup>

To meet diverse population needs, the school employs part-time and fulltime onsite bilingual community liaisons who help school staff communicate with students and families. The school also has an onsite fulltime social worker in addition to a

guidance counselor. The school provides initial placement testing, instruction that meets grade level standards, and an opportunity for specialized instruction to educational procedures and culture in the U.S. The school also coordinates efforts with the local health (e.g., County Health Department, local pediatric community clinics) and social service organizations in support of students and families (e.g., immunization requirements, clothing, medical, and dental needs).

### **Recruitment and Inclusion Criteria**

All students in P.E., Health, and Art classes between the ages of 12 and 17 who spoke English, Spanish, Arabic, French, Vietnamese, or Burmese were provided with a recruitment packet that included a study flyer as well as two parent consent forms (see Appendices F and G). These languages were dependent upon the school's current ethnic groups as well as available staff for translation and interpretation. Packets were distributed by the P.E., Health, and Art teachers at the school. The packets were collected on a regular basis over a four-week period during April 2015. Students who returned packets with parental consent (written) and provided assent (oral and written; see Appendix H) participated in the survey and/or focus groups.

### **Confidentiality, Translation, and Interpretation Services**

Community liaisons (Burmese  $n=1$ , Vietnamese  $n=1$ , Arabic  $n=1$ , Spanish  $n=1$ ) and non-school staff interpreters/translators (Spanish  $n=3$ , Arabic  $n=1$  and French<sup>iv</sup>  $n=4$ ) were trained by the principal investigator regarding confidentiality and the scope of the research project within IRB requirements of The University of North Carolina for

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<sup>iv</sup> French language services were currently unavailable at the school.

community partners assisting with interpretation and translation of research data. Each community liaison and community interpreter/translator provided written documentation acknowledging confidentiality of participants and data as well as their independent choice to participate in this research study.

Community liaisons staffed by the school translated Arabic, Burmese, and Spanish study documents (flyer, parental consent, student assent, surveys). The school's community liaisons' professional duties included regularly translating school documents and communications between the school and families. French and Vietnamese study documents were translated by bilingual, international local college students (e.g., French-student from Ivory Coast at The University of North Carolina at Greensboro and the Vietnamese student from Vietnam who attended the University of North Carolina at Chapel Hill).

Interpretation services during survey collection (assent, oral review of surveys, answering student questions) were primarily provided by community liaison staff at the school (Arabic, Vietnamese, Burmese, and Spanish) with additional trained community members to assist in Spanish, Arabic, Vietnamese, and French services. Interpretation services were provided during the student assent process as well as to review the survey orally and answer questions throughout the survey. Open-ended questions were also translated into English for data analysis by the various school staff and community members previously described.



### **Survey Data Collection**

Surveys were given during P.E., Health, and Art class time in an unused classroom or the school cafeteria. Each survey distribution lasted approximately 45 minutes. Students were divided by language and an interpreter was present with each student group to orally review student assent and the survey and to answer questions. Several research assistants, in addition to the primary investigator, were present to assist with survey distribution, answer any questions the interpreters had regarding the survey or student's questions, as well as to obtain assent for each student. Some younger students (middle school students) took two sessions to complete the survey. Most high school students completed the surveys during one session (one 45-minute class period). A total of 87 surveys were given, 20 surveys were discarded, and 67 surveys were available for analysis. Surveys not included were discarded for the following reasons: (a) student did not record their date of birth and their age could not be verified to fit study inclusion criteria, (b) the student was over the age of 17, (c) the survey was incomplete and the student could not be located to complete the survey on a follow-up day, (d) or students sent to the English group by school staff demonstrated lack of language proficiency during the assent process and could not ethically be included. (To reduce student embarrassment rather than interrupting their assent, the student was allowed to complete the survey, which was marked after it was turned in by the student as "non-language proficient" to be discarded upon analysis.)

### **Anthropometric Measurements**

After completion of the survey, student height and weight were taken by a research assistant of the same gender in a semiprivate area within the classroom/cafeteria. Prior to having their height taken students were asked to remove their shoes (students were verbally given the option to decline removing shoes). Students with religious head coverings were not asked to remove their head coverings prior to having their height taken. Height was taken using a stadiometer and was recorded to the nearest tenth of a centimeter. Weight was taken with a calibrated digital scale and was recorded to the nearest tenth of a kilogram. Each student's measurements were recorded in the indicated area on the final page of the survey to ensure BMI data were correctly identified.

### **Quantitative Data Analysis**

Closed-ended question survey data ( $N=67$ ) were analyzed using IBM SPSS software 20.0. Data analysis focused primarily on descriptive statistics of survey responses as well as bivariate analysis. A dietary acculturation score was developed and calculated specifically for this project and utilized in both descriptive and bivariate analysis (see Table 5.1). The scores ranged from 0 to 9, with larger numbers indicating greater dietary change and 0 indicating no reported dietary change.

Students' date of birth, survey/anthropometric measurement date, height (cm) and weight (kg) were entered into the Center for Disease Control and Prevention BMI Calculator Tool for Schools to calculate BMI.<sup>34</sup> Descriptive analysis was completed on all closed-ended quantitative survey questions (1-46) and focused on frequencies,

median, mode, and mean  $\pm$  standard deviation (Survey Variables; see Appendix J).

Bivariate analysis focused on relationships between gender, refugee camp experience, English at home, region of origin (e.g., Middle East, Africa, Latin America/Caribbean, and Southeast Asia), BMI, dietary acculturation scores, and various reported diet, physical activity, and diet-related perceptions, interests, and behaviors.

Table 5.1

### Dietary Acculturation Score Calculation

Survey Question	Survey Responses and Scoring					Max Score Per Question
12) I have tried new foods in the U.S.	Not yet, and I do <i>not want to</i>	Not yet, but <i>I would like to</i>	A Few  (1–3 different new foods)	Some  (4–5 different new foods)	Many!  (more than 5 different new foods)	New Foods Score:
	0	0.5	1	2	3	<u>3</u>
13) I have tried new beverages in the U.S.	Not yet, and I do <i>not want to</i>	Not yet, but <i>I would like to</i>	A Few  (1–3 different new foods)	Some  (4–5 different new foods)	Many!  (more than 5 different new foods)	New Beverages Score:
	0	0.5	1	2	3	<u>3</u>
29) We eat at home:	We eat almost only <b>traditional foods</b>	We eat <b>mostly traditional</b> foods but we <i>do try</i> new American foods.	We have meals with <b>both traditional foods and American foods</b>		We eat <b>mostly American foods now</b>	Home Food Environment Score:
	0	1	2		3	<u>3</u>
Total Max Dietary Acculturation Score						<u>9</u>

Independent samples *t*-tests utilized dichotomous sociodemographic variables (e.g., gender m/f, refugee Camp experience y/n, English use at home y/n, and BMI normal vs. overweight (ov)/obese (ob)) to examine associations with dietary acculturation scores. Paired samples *t*-tests were utilized to identify significant changes in food category consumption between pre-U.S. diet and physical activity trends and diet and physical activity trends upon arrival to the U.S. Region of origin and BMI categories (underweight, normal, overweight, obese) vs. dietary acculturation scores were analyzed using a one-way ANOVA.

Due to the sample size ( $n=67$ ), Fischer's exact test was selected (vs. Pearson's Chi Square) for sufficient power to examine relationships between sociodemographic variables and dietary and health related perceptions, behaviors, knowledge interests, and needs. To fit the dichotomous variable parameters of Fischer's exact test, four sociodemographic variables (gender m/f, Refugee Camp experience y/n, English use at home y/n, and BMI status normal vs. ov/ob) were utilized and questions regarding dietary choices (survey questions 31 a-k, and survey questions 32-46) were recoded into dichotomous variables. Survey questions 31 a-k, which included influence on dietary choices (e.g., taste, religion), were recoded into two categories for analysis: (a) not important, and (b) somewhat/very important. In comparison, survey questions 32-46 regarding concerns, knowledge, interests, and needs (e.g., I think my diet could be healthier, I think what I eat affects my health) were recoded into two categories for analysis: (a) no/disagree, and (b) maybe/yes. No other survey variables were modified or

recoded. Lastly, all bivariate analysis followed the following criteria to identify statistical significance: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

### **Qualitative Survey Data Analysis**

Open-ended survey questions 47-50 (e.g., list healthy foods, unhealthy foods, topics on which you want more information) were reviewed for themes using open-ended content analysis as outlined by Elo and Kyngäs.<sup>35</sup> Results were quantified and organized in order of decreasing frequency.

### **Results**

The final sample of surveys analyzed ( $N=67$ ) was comprised primarily of Spanish, English, and Arabic surveys (33.8%, 25%, and 19%, respectively) with French, Burmese, and Vietnamese making up the smallest percentages (10.3%, 5.9%, and 5.9%, respectively; see Table 5.2). These languages represented a diverse group of students with 35 countries of origin ( $n=35$  by the student's birthplace,  $n=33$  for their mothers). The sample contained 55.2% female and 44.8% male students with a mean age of  $14.9 \pm 1.7$  years and a mean residence of  $0.77 \pm 0.98$  years in the U.S. Most students attended school prior to arrival (94.1%) and the mean length of previous school was  $7.54 \pm 2.41$  years. Of those students reporting previous residence in a refugee camp ( $n=20$ ), the average length of stay was  $8.45 \pm 6.61$  years (range 16.97). It should be noted that the Arabic survey missed the question regarding refugee camp experience. It is likely many of the Arabic surveys (primary countries of origin included Iraq and the Sudan) would have also included a refugee camp experience.

Table 5.2

Newcomer Youth Demographics ( $N=67$ )

Demographic Variable	<i>n</i> (%)
Survey Distribution by Language (Survey Language)	
Spanish	23 (33.8)
English	17 (25)
Arabic	13 (19.1)
French	7 (10.3)
Vietnamese	4 (5.9)
Burmese	4 (5.9)
Number of languages spoken	
1 Language	28 (41.8)
2 Languages	24 (35.8)
3+ Languages	11 (22.4)
Gender	
Male	30 (44.8)
Female	37 (55.2)
Age (Mean)	14.92 $\pm$ 1.735 years
Time in the U.S. (Mean)	0.77 $\pm$ 0.98 years
Lived in Refugee Camp*	
Yes	20 (37)
No	33 (61.1)
Time in Refugee Camp (Mean)	8.45 $\pm$ 6.61 (range 16.97)
Major Regions Represented	
Africa	24 (35.3)
Latin America/Caribbean	17 (25)
Southeast Asia	12 (17.6)
Middle East	9 (13.2)
Other/Missing	6 (8.8)
Number of countries of origin	
Student (birth)	35 (52.2)
Mother (birth)	33 (49.3)

Table 5.2

Cont.

Demographic Variable	<i>n</i> (%)
Top countries of origin (birth country)	
El Salvador	9 (13.4)
Iraq	7 (10.4)
U.S.	6 (9.0)
Vietnam	4 (6.0)
Sudan	3 (4.5)
Thailand	3 (4.5)
Education prior to U.S.	
Yes	64 (94.1)
No	4 (5.9)
Mean Years of Education Pre-U.S.	7.54 ± 2.41

\*Arabic survey question for refugee camp was missing, *n*=14 surveys were listed as missing in this category, 13 surveys were given in Arabic.

Survey questions regarding household characteristics revealed most families (57.4%; see Table 5.3) did not use English at home and a total of 22 languages were listed as primary languages for the student (over half of the students spoke more than one language; see Tables 5.2 and 5.3). The mean household size was  $6.21 \pm 2.19$  and the mean number of siblings was  $3.55 \pm 2.41$ .

Survey questions regarding household characteristics revealed most families (57.4%; see Table 5.3) did not use English at home and a total of 22 languages were listed as primary languages for the student (over half of the students spoke more than one language; see Tables 5.2 and 5.3). The mean household size was  $6.21 \pm 2.19$  and the mean number of siblings was  $3.55 \pm 2.41$ . Anthropometric data revealed only one student

out of 67 to be underweight, 31.5% ( $n=17$ ) was found to be overweight and/or obese, and 66.7% ( $n=36$ ) of the sample was found to be of normal BMI (see Table 5.4 and Figure 5.1).

Table 5.3

## Household Characteristics

Characteristic	<i>n</i> (%)
Speaks English at home?	
Yes	29 (42.6)
No	39 (57.4)
Primary Language Spoken at Home (Top 4)	
Spanish	22 (32.8)
Arabic	11 (16.4)
Somalian	4 (6.0)
Swahili	4 (6.0)
Total Unique Languages Spoken	22
Mean Household Size	$6.21 \pm 2.19$
Mean Number siblings	$3.55 \pm 2.41$

Survey questions regarding household characteristics revealed most families (57.4%; see Table 5.3) did not use English at home and a total of 22 languages were listed as primary languages for the student (over half of the students spoke more than one language; see Tables 5.2 and 5.3). The mean household size was  $6.21 \pm 2.19$  and the mean number of siblings was  $3.55 \pm 2.41$ . Anthropometric data revealed only one student out of 67 to be underweight and 31.5% ( $n=17$ ) was found to be overweight and/or obese,



and 66.7% ( $n=36$ ) of the sample was found to be of normal BMI (see Table 5.4 and Figure 5.1). Furthermore, rates of overweight and obesity were not distributed equally, and female students had higher rates of overweight and obesity in comparison to male students (37% vs. 25%, respectively; see Figure 5.2). BMI data were also separated per major geographic region with differences in ov/ob trends per group (see Table 5.5, Figure 5.3).

Table 5.4

BMI Data ( $n=54$ )

BMI Category	Males $n$ (%)	Females $n$ (%)	Overall $n$ (%)
Underweight	0 (0)	1 (3.0)	1 (1.9)
Normal Weight	15 (71.4)	21 (63.6)	36 (66.7)
Overweight	4 (19.0)	4 (12.1)	8 (14.8)
Obese	2 (9.5)	7 (21.2)	9 (16.7)

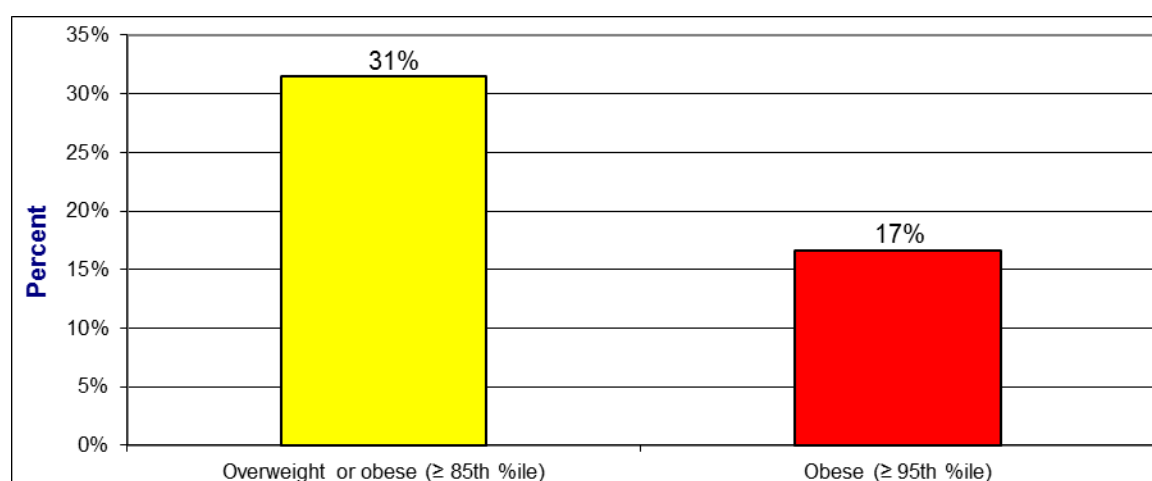


Figure 5.1. Prevalence of Overweight and Obesity in Newcomer Youth Ages 12-17.

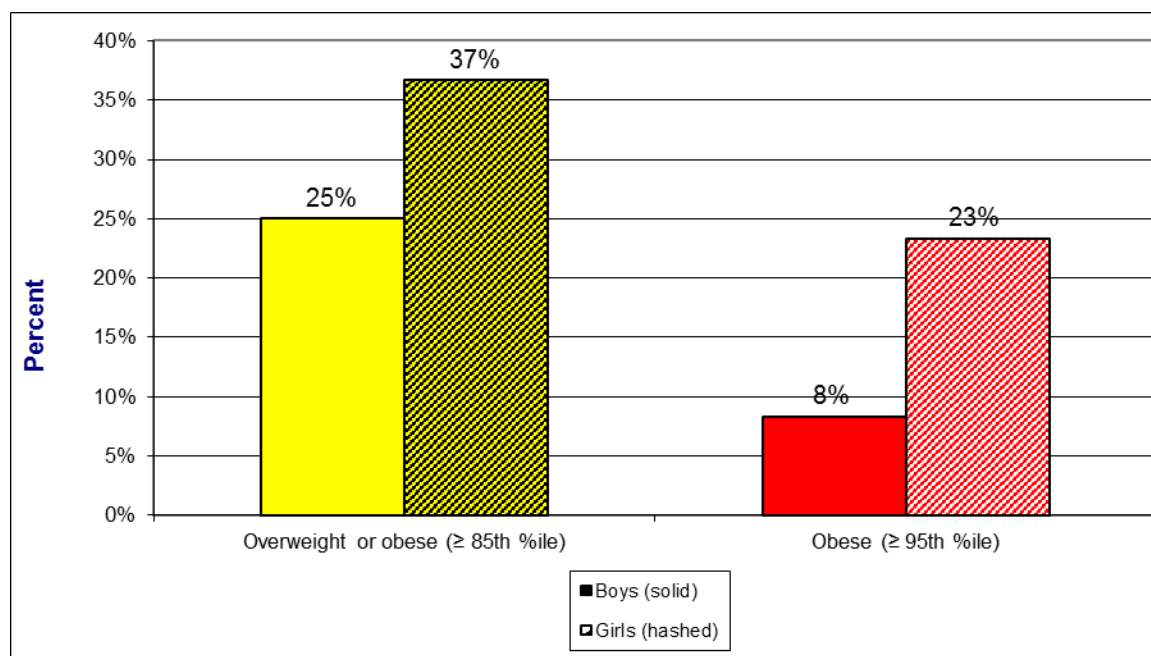


Figure 5.2. Prevalence of Overweight and Obesity in Newcomer Youth Ages 12-17 by Gender.

Table 5.5

BMI Data by Geographic Region

Region	Sample <i>n</i>	Normal <i>n</i> (%)	OV/OB <i>n</i> (%)
Southeast Asia	11	9 (81.8)	2 (18.2)
Middle East	8	5 (62.5)	3 (37.5)
Africa	18	13 (76.5)	4 (23.5)
Central America	14	7 (50)	7 (50)

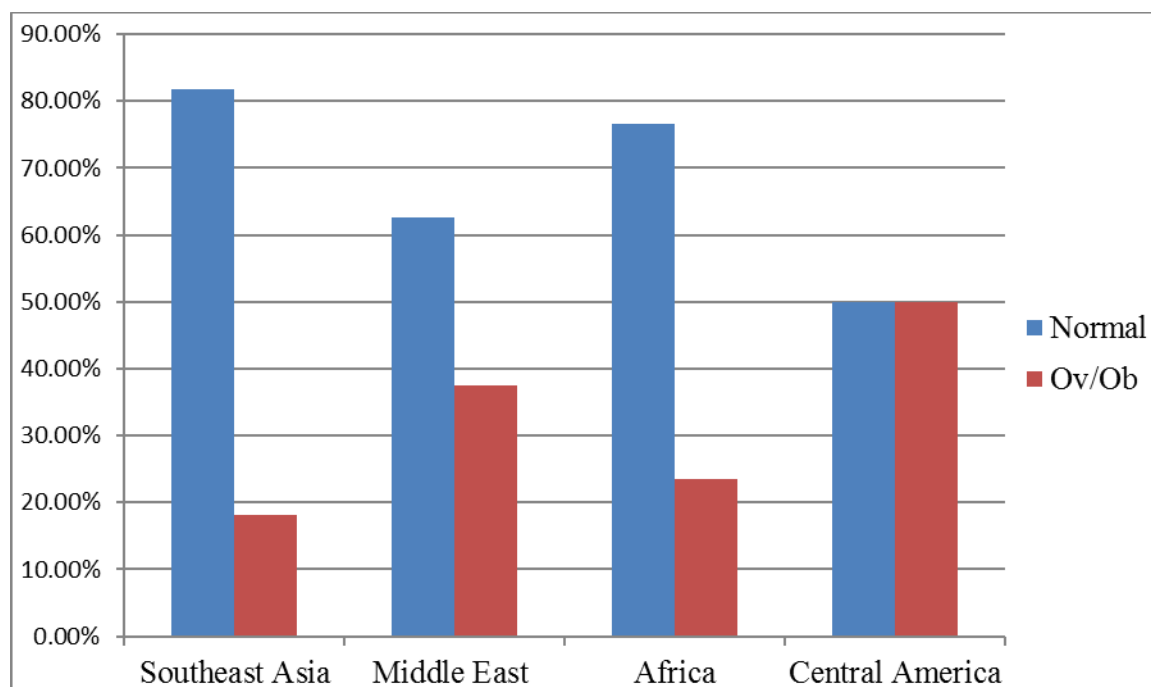


Figure 5.3. Prevalence of Overweight and Obesity in Newcomer Youth Ages 12-17 by Geographic Region.

Lifestyle behaviors related to weight status revealed a variety of perceptions regarding pre- and post-arrival diet quality and physical activity (PA) levels (e.g., 36% perceived they were more active Pre-U.S., and 40.2% perceived they were more active post-arrival to the U.S.). Perceptions of pre-arrival diet quality demonstrated the highest trend with over half of students reported their diet prior to the U.S. to be healthy (see Table 5.6).

In addition to the overall perceptions to diet and physical activity, students were asked specific questions regarding the frequency of consumption of food groups and physical activity. Significant increases between pre- and post-arrival to the U.S. were

identified using paired samples *t*-tests for the consumption of milk, fruit juice, soda, and meat ( $p=0.009$ ,  $p=0.002$ ,  $p=0.026$ , and  $p=0.010$ , respectively; see Table 5.7).

Table 5.6

Perceptions of Diet and Physical Activity Pre-/Post-Arrival to the U.S.

Survey Statement	Survey Responses <i>n</i> (%)
I think my eating before coming to the United States was:	
Less Healthy	13 (20.3)
Healthy	37 (57.8)
Healthier than now	14 (21.9)
Now that I am in the U.S. I think my eating is:	
Less Healthy than before	17 (27.0)
Similar to before	24 (38.1)
Healthier than before	22 (34.9)
I think before I came to the U.S.:	
Less physically active than now	17 (27.0)
Similar level of activity to now	23 (36.5)
More physically active than now	23 (36.5)
Now that I am in the U.S. I think I am:	
Less Physical Active	20 (32.3)
Similar in my physical activity	17 (27.4)
More physically active	25 (40.3)

In addition to the overall perceptions to diet and physical activity, students were asked specific questions regarding the frequency of consumption of food groups and physical activity. Significant increases between pre- and post-arrival to the U.S. were identified using paired samples *t*-tests for the consumption of milk, fruit juice, soda, and meat ( $p=0.009$ ,  $p=0.002$ ,  $p=0.026$ , and  $p=0.010$ , respectively; see Table 5.7).

Table 5.7

Paired Samples *t*-tests Comparison of Food Patterns: Pre- and Post-U.S. Arrival

Food Category: "I ate/eat" "I drank/drink"	Pre-U.S. Mean Frequency <sup>§</sup> of consumption (SD)	U.S. Mean Frequency <sup>§</sup> of consumption (SD)	<i>t</i>	<i>p</i>
Fruits	4.95 (1.69)	5.35 (1.57)	-1.881	0.064
Vegetables	4.92 (1.59)	5.27 (1.43)	-1.464	0.148
Milk	4.76 (2.15)	5.52 (1.63)	-2.703	0.009**
Fruit Juice	4.52 (1.71)	5.23 (1.65)	-3.220	0.002**
Soda	4.00 (1.85)	4.48 (1.91)	-2.293	0.026*
Meat (like chicken, fish, eggs)	4.58 (1.73)	5.09 (1.3)	-2.671	0.010**
Beans or legumes	4.68 (1.65)	4.38 (1.9)	1.574	0.121
Salty snacks like chips or crackers	4.03 (1.88)	4.38 (1.67)	-1.536	0.130
Sweet foods like cookies or cake	4.61 (1.7)	4.74 (1.74)	-.723	0.473
Active for fun	4.95 (1.83)	4.68 (1.92)	1.029	0.307

§1 = *Never*; 2 = *Rarely*; 3 = *Monthly (1-2x)*; 4 = *Weekly (1-2x)* 5= *Weekly (3-5x)*; 6 = *Daily (1-2x)*; 7 = *Daily (3+)* \**p*<0.5, \*\**p*<0.10, \*\*\**p*<0.01

In addition to these specific changes, overall dietary acculturation was assessed and found to be high with only 14.7% of students reporting that they had not tried any new foods and 22.14% had not tried any new beverages (see Table 5.8). Access to traditional foods was perceived to be fairly good (38.2% easy to find, 30.9% most easy, some hard) and perceptions of the taste of traditional foods in the U.S. varied with some reporting taste to be similar (35.3%), better (25%), or not as good (23.5%). American food was perceived by most to be healthy or very healthy (44.1% and 36.8%, respectively).

Table 5.8

Dietary Acculturation (Traditional and American) and Perceptions of Food (Access, Taste)

Survey Question/Statement and Responses	<i>n</i> (%)
I have tried new foods in the U.S.	
Not yet, and I do not want to	4 (5.9)
Not yet, but I would like to	6 (8.8)
A few (1-3 new/different foods)	22 (32.4)
Some (4-5 different/new foods)	14 (20.6)
Many! (More than 5 different/new foods)	22 (32.4)
I have tried new Beverages in U.S.	
Not yet, and I do not want to	5 (7.4)
Not yet, but I would like to	10 (14.7)
A few (1-3 new/different foods)	27 (39.7)
Some (4-5 different/new foods)	14 (20.6)
Many! (More than 5 different/new foods)	12 (17.6)
I think American food is:	
Unhealthy	13 (19.1)
Healthy	30 (44.1)
Very Healthy	25 (36.8)
When I eat my traditional foods in the U.S. they taste:	
Not as good	16 (23.5)
Similar to before	24 (35.3)
Better	17 (25.0)
I am not sure	11 (16.2)
Finding the traditional foods I ate before I came to the U.S. is:	
Easy for most foods	16 (38.2)
Easy for some foods but harder for others	21 (30.9)
Hard for most foods	9 (13.2)
I am not sure	12 (17.6)

Dietary acculturation scores calculated from responses regarding incorporation of new foods, beverages, and meals at home were found to vary between regions (e.g., Mean dietary acculturation for Africa was found to be  $3.77 \pm 1.97$  in contrast to  $5.29 \pm 1.65$  in the Middle East), although not significantly (see Table 5.9, Figure 5.4).

Table 5.9

Dietary Acculturation Scores by Region, Gender, English Use, and BMI ( $n=60$ )

	Mean	Mode	Median
Overall Scores	$4.26 \pm 1.99$	4.0	4.0
Scores by Geographic Region			
Southeast Asia	$4.71 \pm 1.91$	6.0	5.5
Middle East	$5.29 \pm 1.65$	6.0	6.0
Africa	$3.77 \pm 1.97$	3.0	3.25
Central American/Caribbean	$3.91 \pm 2.11$	7.0	4.0
Scores by BMI Category Status			
Underweight	1.0	1.0	1.0
Normal	$4.10 \pm 1.91$	4.0	4.0
Overweight	$4.63 \pm 2.67$	3.0	3.5
Obese	$5.78 \pm 1.73$	7.0	6.0
Scores by English status			
Yes (speaks at home)	$4.03 \pm 1.98$	3.0	4.0
No (speaks at home)	$4.59 \pm 1.99$	4.0	4.0

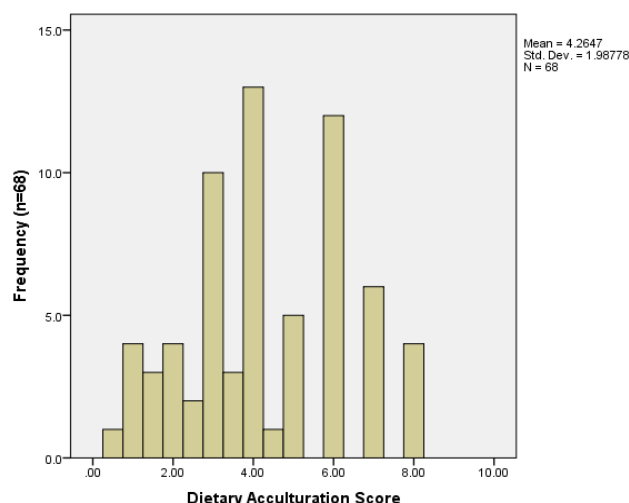


Figure 5.4. Distribution of Dietary Acculturation Scores of Newcomer Youth Ages 12-17.

A one-way ANOVA revealed a marginally significant relationship between dietary acculturation and BMI ( $p < 0.057$ ; see Table 5.10) with a positive trend between dietary acculturation and BMI (e.g., ob/ob adolescents had a mean dietary acculturation score of  $5.23 \pm 2.23$  vs.  $4.09 \pm 1.91$  of participants with a normal BMI). No significant differences were identified in dietary acculturation between geographic regions.

Table 5.10

ANOVA Results: Sociodemographic Characteristics vs. Dietary Acculturation Scores

Sociodemographic Variables	Variation	df	Mean Square	F	Sig
Geographic Region	Within groups	3	7.204	1.876	0.144
	Between groups	58	3.840		
BMI Category	Within groups	3	10.783	2.678	0.057
	Between groups	50	4.027		

Note. Statistically significant differences are indicated \* $p < 0.05$ , \*\* $p < 0.10$ , \*\*\* $p < 0.01$ .



No significant relationships were revealed between dietary acculturation scores and gender, refugee camp experience, BMI status, or use of English at home (see Table 5.11).

Table 5.11

## Sociodemographic Characteristics vs. Mean Dietary Acculturation Scores

Sociodemographic Variables	Categories	Number Samples	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	Sig (2-tailed)
Gender	Male	30	4.43	1.95	0.606	63.24	0.547
	Female	37	4.14	2.05			
English at Home	Yes	39	4.03	1.98	-1.152	60.23	0.254
	No	29	4.59	1.99			
Refugee Camp	Yes	20	4.03	1.82	-0.167	51.00	0.878
	No	33	4.12	2.15			
BMI Status (n vs. ov/ob)	Yes	36	4.10	1.91	-1.920	51.00	0.060
	No	17	5.24	2.23			

*Note.* Independent samples *t*-test performed. Statistically significant differences are indicated \* $p < 0.5$ , \*\* $p < 0.10$ , \*\*\* $p < 0.01$

Another indicator of dietary acculturation (and a factor used in calculating dietary acculturation scores) was the description of consumption of traditional meals at home. One-third (33.3%) reported only traditional foods at home, 22.7% reported mostly traditional foods at home, and 40.9% reported traditional American foods at home (see Table 5.12). Most students reported their mothers prepare meals (59.7%) and that most of the food selection is a combination of adults' and the students'/siblings' preferences

(60%), and eating as a family was found to be important with 67.2% reporting they usually eat together and 20.9% reporting it is important but they are unable to do so.

Table 5.12

## Food Selection, Preparation, and Home Food Environment

Survey Statement/ Question and Responses	<i>n</i> (%)
Who chooses what you eat at home?	
We eat what my parents or grandparents prefer	11 (16.9)
We eat what I and/or my siblings want	14 (21.5)
We eat both foods my parents and me and/or my siblings want	39 (60)
Who prepares the food?	
My mom does most of the cooking	40 (59.7)
My dad does most of the cooking	3 (4.5)
My grandmother does most of the cooking	1 (1.5)
I cook most of our meals myself	4 (6.0)
Different people cook	19 (28.4)
We eat at home:	
We eat almost <b>only traditional</b> foods	22 (33.3)
<b>Both</b> traditional foods and American foods	27 (40.9)
<b>Mostly American</b> foods now	2 (3.0)
<b>Mostly traditional</b> foods, <u>do try</u> American foods	15 (22.7)
Eating at home as a family:	
Eating together as a family is a very important part of the day and we eat together	45 (67.2)
We don't usually eat together as a family	8 (11.9)
We can't eat together as a family because of work and schedules but it is important to eat as a family	14 (20.9)

Students and their siblings have influence over the meals served in the home and many different factors influence their food choices. The highest reported factors include preferences based on the perceived healthfulness of the food (70.1%), the taste (55.2%),

meeting religious criteria (45.3%), as well as convenience (44.6%), culture (41.5%), and family influence (39.4%; see Table 5.13). The lowest ranked factors included TV advertising (6.1%) and friends (10.6%).

Table 5.13

## Influencing Food Choices

Survey Questions*	Survey Responses		
	Not Important <i>n</i> (%)	Somewhat Important <i>n</i> (%)	Very Important <i>n</i> (%)
Health—I want to eat things that are good for me	4 (6.0)	16 (23.9)	47 (70.1)
Taste—it has to taste good to me	10 (14.9)	20 (29.9)	37 (55.2)
Religion—the food has to be allowed by my religion	31 (48.4)	4 (6.3)	29 (45.3)
Convenience—is it easy to get	13 (20.0)	23 (35.4)	29 (44.6)
Culture—familiar to me or that my community/culture eats	17 (26.2)	21 (32.3)	27 (41.5)
Family—if they want me to eat it I will	20 (30.3)	20 (30.3)	26 (39.4)
Cost—it does <i>not</i> cost a lot of money	13 (20.0)	28 (43.1)	24 (36.9)
Time—is it fast to make or get	12 (19.4)	31 (50.0)	19 (30.6)
U.S. Foods—I see American’s eating the food, so I try it/eat it	24 (35.8)	29 (43.3)	14 (20.9)
Friends—my friends eat the food so I try it/eat it	28 (42.7)	31 (47.0)	7 (10.6)
TV—I saw the food on TV so I try it/eat it	34 (51.5)	28 (42.4)	4 (6.1)

\*Listed in decreasing order of importance

Influencing factors on food choices were also compared to dietary acculturation scores using a one-way ANOVA. Dietary acculturation scores were significantly associated with convenience and observation of Americans eating foods influences on selecting foods ( $p=0.003$ ,  $p=0.030$ ; see Table 5.14). Participants who reported convenience and cost as influencing their food choices had lower mean dietary acculturation scores (e.g.,  $3.94 \pm 1.9$  vs.  $5.92 \pm 1.5$  for value of convenience, and  $3.83 \pm 2.0$  vs.  $5.10 \pm 1.73$  for observation of Americans eating foods).

Table 5.14

ANOVA Results: Influencing Factors on Dietary Choices vs. Dietary Acculturation Scores

Sociodemographic Variables	Source of Variation	<i>df</i>	Mean Square	<i>F</i>	Sig
Health—I want to eat things that are good for me	Within groups	2	2.548	0.632	0.535
	Between groups	64	4.031		
Taste—it has to taste good to me	Within groups	2	6.792	1.742	0.183
	Between groups	64	3.899		
Religion—the food has to be allowed by my religion	Within groups	2	1.081	0.266	0.767
	Between groups	61	4.067		
Convenience—is it easy to get	Within groups	2	21.725	6.457	0.003**
	Between groups	62	3.365		
Culture—familiar to me or that my community/culture eats	Within groups	2	5.765	1.468	0.238
	Between groups	62	3.926		
Family—if they want me to eat it I will	Within groups	2	3.408	0.843	0.435
	Between groups	63	4.042		

Table 5.14

Cont.

Sociodemographic Variables	Source of Variation	<i>df</i>	Mean Square	<i>F</i>	Sig
Cost—it does <i>not</i> cost a lot of money	Within groups	2	2.396	0.587	0.559
	Between groups	62	4.079		
Time—is it fast to make or get	Within groups	2	8.082	2.171	0.123
	Between groups	59	3.723		
U.S. Foods—I see American's eating the food, so I try it/eat it	Within groups	2	13.690	3.717	0.030*
	Between groups	64	3.683		
Friends—my friends eat the food so I try it/eat it	Within groups	2	1.939	0.474	0.625
	Between groups	63	4.088		
TV—I saw the food on TV so I try it/eat it	Within groups	2	10.392	2.721	0.074
	Between groups	63	3.820		

*Note.* Survey questions listed in order of decreasing frequency interest/agreement, statistically significant differences are indicated \* $p < 0.05$ , \*\* $p < 0.10$ , \*\*\* $p < 0.01$

In addition, Fischer's exact test was utilized to examine sociodemographic variables on influencing factors on food choices. Perception of convenience was significantly associated with gender ( $p = 0.052$ ; see Table 5.15) with convenience more likely to determine food choices with female students (e.g., 88.6% of females reported convenience as somewhat or very important in comparison to 69% of males). Perception of religion, culture, family, time, American consuming foods, and friends were significantly greater for students who reported having lived in a refugee camp ( $p = 0.033$ ,  $p = 0.051$ ,  $p = 0.029$ ,  $p = .032$ ,  $p = 0.005$ , and  $p = 0.008$ , respectively). Use of English at home was not significantly associated with food choices. BMI category was significantly

associated with taste and cost ( $p=0.010$  and  $p=0.009$ , respectively) with overweight and obese students more likely to report taste as important, and cost as unimportant.

Table 5.15

Fischer's Exact Test Results: Sociodemographic Variables vs. Influencing Factors on Food Choices

Survey Questions	Significance ( $p$ values) by Sociodemographic Variables			
	Gender (M/F)	Refugee camp (Y/N)	English at home (Y/N)	BMI Category (n vs. ov/ob)
Health—I want to eat things that are good for me	0.596	0.501	0.585	0.218
Taste—it has to taste good to me	0.549	0.058	0.472	0.010**
Religion—the food has to be allowed by my religion	0.267	0.033*	0.590	0.543
Convenience—is it easy to get	0.052*	0.322	0.571	0.412
Culture—familiar to me or that my community/culture eats	0.577	0.051*	0.543	0.547
Family—if they want me to eat it I will	0.589	0.029*	0.178	0.452
Cost—it does <i>not</i> cost a lot of money	0.543	0.073	0.429	0.009**
Time—is it fast to make or get	0.449	0.032*	0.279	0.622
Seeing Americans eat the food	0.508	0.005**	0.524	0.339
Friends—my friends eat the food so I try it/eat it	0.309	0.008**	0.274	0.074
TV—I saw the food on TV so I try it/eat it	0.529	0.301	0.586	0.127

\*Survey questions listed in order of decreasing frequency interest/agreement, \*\* statistically significant differences are indicated \* $p<0.5$ , \*\* $p<0.10$ , \*\*\* $p<0.01$

Students also reported many strong interests and perceived needs with physical activity with 84.8% reporting they would like to be more active, play more sports (84.7%) and that being physically active helps them to be healthy (83.1%; see Table 5.16). In addition, students reported dietary concerns (62.5%) and interest in receiving nutrition education (77.6%). Moreover, approximately half of the students (56.9%) reported they would like for their family to receive nutrition education and approximately half (50.8%) reported they were worried about the health of a family member. With regards to weight status, only 36.1% reported their weight to be “good” and 46.8% had tried to lose weight. In addition, 45.8% reported people talk to them about their weight, with their parents being the most frequently reported individuals (48.3% mom, 17.2% dad, 6.9% mom and dad).

Table 5.16

Health, Diet, Weight Interests, Attitudes, Knowledge, Concerns

Survey Questions/Statements	Survey Responses		
	No/ I Disagree <i>n</i> (%)	Not Sure, Maybe <i>n</i> (%)	Yes/ I Agree <i>n</i> (%)
I would like to be more active	1 (1.5)	9 (13.6)	56 (84.8)
I would like the opportunity to play more sports	2 (3.4)	6 (10.2)	50 (84.7)
I think being physically active helps me to be healthy	2 (3.1)	9 (13.8)	54 (83.1)
I would like to learn more about how food affects my health	5 (7.5)	10 (14.9)	52 (77.6)
I think my diet could be healthier	5 (7.8)	19 (29.7)	40 (62.5)
I think I am healthy	5 (7.5)	24 (35.8)	38 (56.7)

Table 5.16

Cont.

Survey Questions/Statements	Survey Responses		
	No/ I Disagree <i>n</i> (%)	Not Sure, Maybe <i>n</i> (%)	Yes/ I Agree <i>n</i> (%)
I think my family needs to learn what foods are healthy in the U.S.	7 (10.8)	21 (32.3)	37 (56.9)
I would like to exercise with only other boys/girls	6 (9.1)	24 (36.4)	36 (54.5)
I am worried about the health of someone in my family	16 (24.6)	16 (24.6)	33 (50.8)
My family talks to me about my weight	17 (28.8)	15 (25.4)	27 (45.8)
I have tried to lose weight	16 (25.8)	17 (27.4)	29 (46.8)
I think my weight is good	14 (23.0)	25 (41.0)	22 (36.1)
I think what I eat affects my health	10 (15.4)	28 (43.1)	27 (41.5)
I would like my family to learn how to cook American foods	13 (20.0)	25 (38.5)	27 (41.5)

Health, diet, weight interests, attitudes, knowledge, and concerns were also compared to dietary acculturation scores using a one-way ANOVA. No significant relationships were observed. Health, diet, weight interests, attitudes, knowledge, and concerns were also compared to gender, refugee camp experience, using English at home, and BMI status using Fischer's exact test. One significant relationship was identified between BMI status and body image ("I think my weight is good";  $p=0.01$ ; see Table 5.17). Students in the normal BMI were most likely to report a positive body image in comparison to ov/ob students (85.7% vs. 56.3%).



Table 5.17

Fischer's Exact Test Results: Sociodemographic Variables vs. Health Literacy, Concerns and Perceptions, Nutrition, and Physical Activity Needs and Interests

Survey Questions	Significance ( <i>p</i> values) by Sociodemographic Variables			
	Gender (M/F)	Refugee camp (Y/N)	English at home (Y/N)	BMI Category (n vs. ov/ob)
I would like to be more active	0.554	0.392	0.561	0.686
I would like the opportunity to play more sports	0.214	0.429	0.643	0.286
I think being physically active helps me to be healthy	0.705	0.140	0.182	n/a
I would like to learn more about how food affects my health	0.616	0.499	0.274	0.218
I think my diet could be healthier	0.423	0.275	0.590	0.201
I am worried about the health of someone in my family	0.439	0.613	0.642	0.318
I think I am healthy	0.384	0.501	0.372	0.360
I think my family needs to learn what foods are healthy in the U.S.	0.299	0.197	0.197	0.664
I would like to exercise with only other boys/girls	0.361	0.668	0.620	0.681
I have tried to lose weight	0.435	0.435	0.069	0.627
I think my weight is good	0.213	0.798	0.767	0.010**
I think what I eat affects my health	0.538	0.283	0.514	0.495
I would like my family to learn how to cook American foods	0.594	0.557	0.571	0.128

*Note.* Survey questions listed in order of decreasing frequency interest/agreement  
 Statistically significant differences are indicated \**p*<0.5, \*\**p*<0.10, \*\*\**p*<0.01

Dietary trends (pre- and post-arrival to U.S.), influences on food choices, nutrition and health perceptions, and level of physical activity were also analyzed per geographic region (see Table 5.18).

Table 5.18

ANOVA Results: Significant Differences by Geographic Region

	Source of Variation	<i>df</i>	Mean Square	<i>F</i>	Sig
Pre-U.S. Fruit Consumption	Within groups	58	2.725	3.416	0.023
	Between groups	3	9.310		
Pre-U.S. Vegetable Consumption	Within groups	57	1.809	6.975	0.000
	Between groups	3	12.619		
Pre-U.S. Milk Consumption	Within groups	49	3.866	3.785	0.016
	Between groups	3	14.631		
Pre-U.S. Fruit Juice Consumption	Within groups	57	2.406	3.546	0.020
	Between groups	3	8.533		
Pre-U.S. Salty Snacks	Within groups	57	3.133	2.728	0.052
	Between groups	3	8.546		
Pre-U.S. Physical Activity	Within groups	58	3.245	2.824	0.047
	Between groups	3	9.164		
U.S. Meat Consumption	Within groups	56	1.418	4.594	0.006
	Between groups	3	6.513		
U.S. Milk Consumption	Within groups	53	2.132	3.002	0.039
	Between groups	3	6.400		
Taste- it has to taste good (food selection influences)	Within groups	57	0.419	4.203	0.009
	Between groups	3	1.760		
Religion (food selection influence)	Within groups	54	0.696	7.729	0.000
	Between groups	3	5.379		
Sports Preference for Physical Activity	Within groups	32	7.982	3.763	0.020
	Between groups	3	30.040		
Time in U.S.	Within groups	52	0.202	3.343	0.026
	Between groups	3	0.675		
Time in Refugee Camp	Within groups	12	31.186	4.423	0.036
	Between groups	2	137.933		

Significant differences were observed between geographic regions regarding preferences for physical activity with students from South East Asia preferring to go to the “gym,” students from Africa and Central America preferring soccer, and students from the Middle East reporting biking as their preferred method for physical activity.

Significant differences in time in the U.S. also were observed with students from Central America residing in the U.S. the longest (e.g., 0.98 years for Central America vs. 0.55–0.59 years in other regions). In addition, dietary trends and influencing factors on food choices varied per region. Students from Africa, the Middle East, and Southeast Asia reported religion as “Very Important” as an influence on their food choices whereas students from Central America were more likely to list religion as “Not Important.” Also, students from Africa, the Middle East, and Southeast Asia reported taste as “Very Important” as an influence on their food choices whereas students from Central America were more likely to list religion as “Somewhat Important.” Lastly, diet trends varied between groups with the greatest quantity of significant differences occurring in pre-arrival diets and physical activity (e.g., the lowest amount of milk was consumed by Southeast Asian and Central American students prior to arrival, the lowest amount of vegetables were consumed by Central American students prior to arrival, and fruit and fruit juice were the lowest for Southeast Asian and Central American students). Salty snack consumption was the highest for students from the Middle East and lowest for Southeast Asian students (mean consumption 5.4 vs. 3.27, 3.88, and 4.29). Upon arrival to the U.S. milk consumption was the lowest in Central American students and highest for African students (4.5 vs. 5, 5.78, and 5.95) and consumption of meat was the lowest

for Central American and Southeast Asian students and the highest for Middle Eastern students (4.56 and 4.58 vs. 6.11).

In addition to the previous quantitative survey results, students were also provided the opportunity to answer open-ended free response questions. Students were asked about their preferences for exercise and sports with running, soccer, and basketball as the most popular responses for both exercise as well as sport preferences. See Table 5.19.

Table 5.19

Open-ended Survey Question Data: Physical Activity

Survey Topic	Themes
“I would like the opportunity to play more sports” (What sport? _____)	Soccer, football, basketball, volleyball, running, tennis
I would like _____ for exercise	Running, soccer, basketball, gym/weights, swimming

Note. Themes listed by decreasing frequency in popularity and were listed by individual/different students  $\geq n=2$ . Due to consistent similarity of activity preferences, PA themes not separated by language

Students were also asked about their diet within the open-ended free response sections. Students most frequently reported vegetables, meat, fruit, and milk as healthy foods and sweets, fast food, chips, oil/fat/greasy foods, and sodas as unhealthy foods (see Table 5.20).

Table 5.20

## Open-ended Survey Question Data: Nutrition and Health

Survey Topic	Themes					
	English	Spanish	French	Arabic	Vietnamese	Burmese
Healthy Foods (list)	Fruits (general fruits, apples, bananas) meat (chicken, meat), vegetables, eggs, juice, milk, “traditional: food, rice	vegetables, fruits, meat (fish, chicken, “meat”), salad, beans, eggs, rice, soup, juice	meat, vegetables, fruit, milk, rice	Meat (“meat”, chicken, fish), fruit, vegetables, legumes, milk	Meat (meat, fish, chicken), vegetable, milk	fruit (banana, orange, apple), vegetable
Unhealthy Foods (list)	sweets (“sugar, cake/cookies/candy), soda, fast food, chips, milk	Fast food, soda (pizza, hamburger, hot dogs, fast food), sweets (cake, others), chips, oil/greasy/fried, salt, canned foods, beer, bread	chips, sweets,	sweets (dessert, candy, cookies, “sugar”), chips, soda, pork		soda, fast food, oil/fat

\*Themes listed by decreasing frequency in popularity and were listed  $\geq 2$ , if specific items listed more than twice per category they were listed in parenthesis following category

Students were also asked what foods were important for them to consume regularly. These foods correlated with foods that were identified previously as “healthy” foods and primarily focused on meats, vegetables, fruits, and milk (see Table 5.21). Special foods to eat also included meat, rice, and injera (pancake-like bread common in Ethiopian diets). Foods to avoid included pork and alcohol.

Table 5.21

Open-ended Survey Question Data: Important Foods (Daily, Cultural)

Survey Topic	Themes					
	English	Spanish	French	Arabic	Vietnamese	Burmese
Foods important to eat regularly	meat (chicken, “meat,” fish), fruit, vegetables, rice, milk, juice,	fruits, vegetables, meats (chicken, “meat”), salad, beans, rice, cereal, juice	Meat (variety-animal sources), fruit	fruits, vegetables, meat (meat, chicken), legume/beans, rice, milk/ yogurt	vegetables	vegetables, beans
Special foods (to eat or avoid)	rice, meat (chicken, fish, goat), injera	vegetables (onions, cucumbers), chicken	pork, alcohol	pork, alcohol	meat	

\*Themes listed by decreasing frequency in popularity and were listed  $\geq 2$ , if specific items listed more than twice per category they were listed in parenthesis following category

Lastly, students were given an opportunity within the open-ended free response section of the survey to list any nutrition or health topics about which they would like to receive more information or information. General nutrition (balanced diet), weight loss and dieting information, information on American foods and how to select healthy foods, portion sizes, and the specific effects of nutrition on health were the nutrition themes identified (see Table 5.22). In addition, students were interested in information on how to “stay healthy” as well as diet-related conditions such as diabetes.

Table 5.22

Open-ended Question Survey Data: General Health/Nutrition Education Interest

(Request(s) for More Information)

Survey Topic	Themes
Nutrition	<ul style="list-style-type: none"> <li>• general nutrition</li> <li>• American foods</li> <li>• weight loss</li> <li>• healthy weight (what is “not too fat”)</li> <li>• “unhealthy foods”</li> <li>• “how do greasy foods effect my health”</li> <li>• balanced diet</li> <li>• basic nutrition and effects on health</li> <li>• portion sizes</li> <li>• “what should we eat”</li> </ul>
General Health	<ul style="list-style-type: none"> <li>• diabetes</li> <li>• “how to be healthy”</li> <li>• “how to keep being healthy”</li> </ul>

### Discussion

The objective of this study was to examine nutrition and health knowledge, changes (e.g., food choices, physical activity), perceptions, and interests of newcomer youth. To the knowledge of the author the brief time in the U.S. (most less than one year) and the diversity within this sample of newcomer adolescent participants are unique to this study.

Students’ perceptions of the healthfulness of their diet and level of physical activity pre- and post-arrival to the U.S. was widely variable. Upon more specific questions regarding dietary trends pre- vs. post-arrival only one food category was found to have declined (beans, legumes). Reported consumption of milk, meat, fruit juice, and

soda consumption upon arrival to the U.S. were found to have been significantly increased. No significant increases in salty snacks and sweets were identified. Few studies have examined dietary trends pre- vs. post-arrival for comparison to identify significant changes to the diet, and even less have quantified trends in consumption for comparison. Studies which have examined pre-arrival diet compared to post-arrival diet trends have identified similar results to this study. Dharod (2015) also found significant increases in meat and dairy consumption upon arrival in the U.S. and a reduction in consumption of legumes/beans in adult Montagnard women.<sup>36</sup> Colby, Morrison, and Haldeman (2009) identified increases in fruit juice consumption in Mexican immigrant youth as well as an increase in snack foods and convenience foods.<sup>37</sup>

This study also identified significant increases in milk consumption. Milk consumption has also been found to have increased in Asian youth over subsequent generations and was less often a component of a traditional pre-arrival diet.<sup>7,23</sup> Milk consumption in Somali adolescent girls is reported to be higher at school than home, and it is likely the access and promotion of milk with school lunch has promoted the consistently reported increases in dairy in the U.S.<sup>38</sup> This increase in milk consumption is a positive change; for example, with Hispanic and Hmong children milk consumption has been reported to be a significant predictor in decreasing ov/ob odds (vs. soda, which has been significantly associated with ov/ob risk, and intake was reported to have increased significantly in this study).<sup>16,23,39</sup> These increases in milk, especially during adolescence, suggest some positive and protective dietary changes in the U.S.; however, both soda and fruit juice consumption were also found to have significantly increased upon arrival and



are associated with obesity risk which is concerning due to the already elevated obesity rates in this study which were higher than the national average (e.g., 17% vs. 14%, respectively).<sup>40</sup>

In contrast to changes in dairy, meat, fruit juice, and soda, fruit and vegetable consumption was not reported to have significantly changed. Other studies have found fruit and vegetable consumption to have decreased in Hispanic youth over time; decreases in vegetable consumption has been associated with insulin resistance in Hispanic youth.<sup>23,41</sup> Fruit and vegetable consumption has also been significantly associated with less acculturation with Hispanic youth.<sup>21</sup> Studies with Asian youth have revealed varying trends. For example, in a study with Hmong youth, overall diet quality has been reported to decrease over time as salt, fat, and overall calories increase; however, in another study with generalized “Asian” youth, fruit and vegetable consumption remained consistent through three generations.<sup>16,23</sup> Participants in this study did identify fruits, vegetables, and meats as important foods to consume daily and it is possible that these foods did not change significantly upon arrival due to perceived daily value and incorporation in the diet. It is also possible that these results (e.g., fruit, vegetable, salty snacks, and sweets) are due to the early nature of arrival and limited exposure to American culture (e.g., attending a specialized school limits opportunity to come in contact with as many American peers); however, other significant changes were reported to have occurred within this short timeframe (e.g., milk, soda, fruit juice).

Dietary acculturation was considered to be high within the brief time and exposure in the U.S. with limited students reporting they had not tried any new foods or

beverages (14.7% and 22.1%, respectively) and 33% percent of students reporting they consume “only traditional meals at home.” Most students report good access to their cultural foods as well as acceptance (taste) of their cultural foods here in the U.S. Traditional meals at home are mostly prepared by mothers; food choices impacted by both generations and eating together as a family was strongly valued across all students. Dietary acculturation scores were associated increases in BMI in this study which has been identified in other studies (e.g., dietary acculturation has also been identified as a significant predictor of increases in BMI and poor diet quality with Hmong youth).<sup>16,20</sup> It is also important to note that dietary acculturation was measured by ranking incorporation of new foods after arrival in addition to categorization of home meals (traditional vs. American foods), where as in some studies it has been determined by level of “association” with the host culture and/or the host culture’s foods.

Movement towards the “host diet” or “Westernized” diet is frequently reported with newcomer youth; however, influencing factors on dietary choices and changes to the diet (both positive and negative) are rarely assessed. Increase in affordability, accessibility, and less time for food preparation have also been reported to be associated with increased consumption of fast foods, convenience foods, and snack foods.<sup>8,10,29,37</sup> In contrast to these previously described study findings, results from this study found dietary acculturation to be significantly associated with less perceived influence by convenience or cost. This could also be due to the age of the participants in this study and other studies mostly involving adult participants. In addition, TV advertising and peers were the least likely to impact food choices. The level of exposure and/or quantity of

screen time for students is unknown. It is possible that less exposure to American/English television has resulted in the lack of influence. Food advertising may also vary by language and if students are not as exposed to American/English television they may not be as strongly influenced (e.g., Fleming et al. found Spanish television to have less food advertising in comparison to American/English television).<sup>42</sup> There was also a difference in perceived influence of convenience by gender with female participants more likely to report convenience to be of value; this may be due to their greater responsibility in preparing food. Refugee camp experience was also significantly associated with a greater range of perceived influences on food choices (e.g., family, culture, religion, etc.); however, most of these perceptions were related to tradition and culture rather than taste, cost, convenience, etc. More work is needed to understand the impact of refugee camp experience on adolescents' eating habits and weight gain in the U.S. (many in this study spent the majority or all of their life in a refugee camp).

Students with higher BMIs were more likely to rank taste and less likely to rank cost as an influencing factor. Dietary acculturation increases with BMI. It is possible that those with less economic resources (currently and/or prior) may not have access to as many new foods and that budget limitations reduce the willingness to incorporate new foods which may not be favored. It is also possible that poor budgeting skills and previous lack of access to socially valued foods have led to increased incorporation in the U.S. despite budget restrictions and potentially poor economic resources with new arrivals. In a study by Story and Harris, Vietnamese, Hmong, and Cambodian refugee youth foods that were expensive but highly valued culturally (e.g., meat, fruits, soda)

remained preferred and increased in consumption in the U.S.<sup>28</sup> In a study by Franzen and Castle with Hmong adults and adolescents it was reported, “you didn’t have that much money back then but now it is like you are so much better off and you consume all this stuff you don’t need . . .,” and participants reported consuming food in excess with greater access and financial stability.<sup>10</sup> In a paper by Rondinelli et al., lack of prior access was found to increase consumption with refugees: “Many of them starved in the past so when they do have food they will literally eat until they explode, figuratively of course. I’ve seen it here.”<sup>9</sup> It is possible that as newcomers have more resources to purchase food they may be at more risk for gaining weight (can choose based on taste and not be as concerned with cost).

With globalization of the food supply it is possible (or likely) that “dietary acculturation” that exists under the assumption of moving towards the “host” country’s diet may be oversimplified and that it is not necessarily a shift in increasing to “new foods,” but rather increased incorporation due to changes to this improved access and affordability. It may be more accurate to report “diet changes” in place of “dietary acculturation.” For example, studies with Mexican groups have found access to a variety of snack and convenience foods as well as soda prior to arriving to the U.S., suggesting that moving to the U.S. does not introduce these foods but rather makes them more accessible.<sup>37</sup> Moreover, many studies lack assessment of pre-arrival diet which further limits assessment of change.

In addition to the dietary changes, trends, and influencing factors, physical activity was also examined in this study, as activity level is strongly associated with long-

term health and chronic disease prevention. This study found reported physical activity to have decreased upon arrival to the U.S. with high interest (>80%) in increasing physical activity (especially sports). Specific preferences regarding activities were also identified with running, soccer, and basketball as top preferences. Physical activity is more strongly associated with perceived influence on health outcomes than diet (83.1% vs. 41.5%, respectively). Students demonstrated basic knowledge with regard to nutrition (e.g., fruits, vegetables, and milk were listed as healthy foods and salt, sugar, and fat as unhealthy). Studies examining health literacy with newcomer youth is limited but has been incorporated in some nutrition studies. In a study with Hmong young adults and youth, fruit and vegetable consumption and physical activity are associated with health. A study with Somali female adolescents demonstrated an understanding of dairy and calcium for bone health, and a study with African youth demonstrated an understanding of the adverse effects of low physical activity, sugar, and oil on health.<sup>8,19,29,38</sup> Students had a very basic sense of nutrition; however, it is concerning that they did not perceive their diet as valuable as physical activity in supporting health. Despite these concerning perceptions, in the open-ended section students most frequently reported interest in obtaining more nutrition information and how to be/stay healthy despite the limited association of diet with health.

Physical activity was most strongly associated with maintaining and supporting health, and students were very interested in having more opportunities to be active. Many studies have found decreases in physical activity upon arrival for a variety of reasons—less incorporation in daily living activities, less safe space, and less access to organized

sports.<sup>8,19,23,27,29,30,37</sup> Some studies have also identified higher cultural barriers by gender; for example, Hispanic and African girls (e.g., Sudanese mother “not married, may not go out alone”) may be less likely to be allowed out on their own which may serve as a barrier to participate in recreational physical activity.<sup>8,29</sup> Additionally, a study with Hmong young adults and adolescents reported concerns with young females having too much physical exertion or activity and the negative effect on fertility.<sup>29</sup> The potential for less access to physical activity for female adolescents is especially concerning in light of the higher level of ov/ob in female vs. male participants in this study (e.g., 37% vs. 25% overweight, and 23% vs. 8% obese, respectively).

The overall high level of overweight and obesity in this sample is concerning. A study with refugee pediatric patients found ov/ob rates to double over a span of three years and a study with Hmong youth found increases in BMI to be associated with high blood pressure.<sup>18,43</sup> The high rates of obesity may also correspond with the reported body dissatisfaction and weight-related concerns. Only 36.1% of students report satisfaction with their weight (e.g., “I think my weight is good”), 46.8% have tried to lose weight, and 45.8% have had someone (usually a parent) discuss their weight with them. Dieting information and “healthy weight” were also frequently listed as a nutrition topic about which students wanted more information. BMI was also significantly associated with perception of weight, as students with a normal BMI were most likely to agree with the statement, “I think my weight is good.”

Body dissatisfaction and unhealthy and extreme dieting behaviors have been identified with diverse, newcomer youth. Dieting behaviors have also been associated

with higher BMIs long-term.<sup>44</sup> To further complicate the picture, differences in weight have been identified between generations in other studies in both African and Asian families with parents concerned about their children's weight gain or cultural favoritism towards excess weight and gaining weight indicating social and economic status, health, and positive parenting and provision for the family.<sup>10,30</sup> Youth have been reported to be torn between their parents' desire for them to gain weight and to fit in with Westernized cultures that favor "thinness."<sup>10,30</sup> It is also unknown if body dissatisfaction reported here and elsewhere is attributed directly to Westernized culture and/or media influence. In a study by Lopez et al. (2013), media was not found to influence perception of appearance or disordered eating in Hispanic youth.<sup>45</sup> Studies with a variety of diverse youth participants (Hmong, Hispanic, Somali, and other African groups) have found extreme weight management and dieting behaviors, poor body image, and high body dissatisfaction.<sup>25,27,30,44,46</sup> Studies with influence on body satisfaction, weight, and dieting are limited with diverse and newcomer youth despite documented risks of poor body image. Dieting behaviors and future research in this area is warranted, particularly in light of long-term repercussions of dieting behaviors on increased future BMI and therefore chronic disease risk.

Some students may be at greater risk for obesity and long-term chronic diseases. For example, students from Central America and the Middle East had the highest rates of ov/ob. Students from Central America had the highest rates of ov/ob and had resided in the U.S. significantly longer than students from other regions, suggesting that length of time the U.S. may be associated with increased risk of ov/ob as has been found in other

studies.<sup>18,43,47</sup> Students from the Middle East had the highest dietary acculturation scores. Furthermore, other significant differences between geographic regions regarding dietary trends pre- and post-arrival to the U.S. reported observing influencing factors on food choices as well as physical activity levels and preference.

Students in different geographic regions significantly differed in their consumption of major food groups by geographic region (e.g., fruit, vegetables, milk, fruit juice, and salty snacks pre-arrival) as well as post-arrival (e.g., meat, milk). Students also varied in their preferences for physical activity (e.g., African and Central American students prefer soccer, students from the Middle East prefer biking, and Southeast Asian students prefer “going to the gym” for physical activity). Reported influence on food choices also varied, with Central American students the least influenced by taste and/or religion. These findings highlight distinct needs and preferences of students from varying geographic regions. Moreover, although all students were “newcomers,” they arrived from 35 different nations, each bringing individual backgrounds, experiences, preferences, and needs which were observed by these significant differences per region. These regional differences support the need to evaluate and focus on the unique and distinct cultural trends, needs, and perceptions of individual groups to design tailored, targeted future interventions and resource development.

There are limitations to this study. The diversity of the sample made it difficult to group participants during analysis, and groups were derived by geographic area rather than nationality or ethnicity. This may have impacted the results, particularly in bivariate analysis. Differences in language between the translations of the survey may also have



impacted the reliability of the data analysis and results. Although a unique factor in this study, the timeline and limited exposure and experience in the U.S. may have muted the changes reported and experienced by the students. It is possible that if the study had been conducted after more time and/or exposure to American culture greater changes and/or perceptions and influencing factors may have been reported. However, this limited exposure to American culture was also a unique factor of this study. Lastly, despite these proposed limitations this study did find many consistent trends across a very diverse group of newcomers which suggests some consistency in experience for newly-arrived youth (e.g., desire for more PA, high levels of dietary acculturation, increase in soda, fruit juice, milk, meat, body dissatisfaction).

Many questions remain and should be the focus of future studies. A unique component of this study was the assessment of influencing factors on dietary choices; however, much more needs to be examined to understand the driving forces in dietary change. More research should be conducted to evaluate exactly why/how food choices change and how this varies or is consistent between different major incoming groups. In order to address unhealthy changes to diet, future research should better examine dietary trends as well as social and economic changes pre- vs. post-arrival. In addition to dietary changes, physical activity is also an area to be addressed in future studies. Gender differences in access as well as interests should also be further evaluated as well as identifying preferences and cultural appropriate physical activity opportunities between genders and groups. In light of the ov/ob rates, diet trends, and weight concerns,

improving PA may offer many positive promises in maintaining a healthy weight and reducing long term chronic disease risk, poor body image, and weight dissatisfaction.

This study identified high levels of overweight and obesity population, significant (negative and positive) dietary changes, strong interest and need to improve physical activity access, and poor body image in a diverse group of newcomer youth. This study quantified diet and PA levels pre- and post-arrival, traditional food access, and dietary acculturation, perceptions that guide food choices and health literacy. Differences per region were also identified in pre- and post-arrival dietary trends, PA preferences, and influencing factors on food choices. Despite many new and unique findings, more work is needed to better understand newcomer youth to reduce the many risks identified in these populations (e.g., ov/ob, limited PA, preferences and needs within cultural groups, poor body image, poor diet) to support their long-term health and reduce the risk of chronic disease and disparities with these populations. Lastly, interventions focusing on newcomer youth are limited to unknown for many cultural groups, and due to their risk level for chronic disease (e.g., limited PA, poor diet, ov/ob trends), future research should invest in developing and evaluating interventions targeted at newcomer youth.

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## CHAPTER VI

### EPILOGUE

This work provided a unique opportunity to interact with a diverse group of newcomer families and adolescents. It was an incredible learning experience and it solidified my interest and passion to work with international populations.

One of the most emotional components of this work was the “behind the scenes” effort to be culturally competent regarding the individual conditions from which the families and adolescents were arriving. As I began to collect data and see from where the students and families were arriving, I would study the current political and social conditions that pushed so many individuals to flee their homes or to start over in the U.S. As I read about the violence driving Latino immigrants out of Honduras and El Salvador and the continuing conflicts all over Africa and the Middle East my heart was heavy, and then I would arrive at the school and interact with resilient, smiling, laughing energetic adolescents. One in particular, a smaller, male student from the Sudan with the most beautiful smile and name that I will always remember will stay with me forever. I remember asking one of my Arabic interpreters to help me say a few words in Arabic to him. As I stumbled over what I am sure was horrible Arabic, I still remember his beautiful smile lighting up his face as I undoubtedly butchered his language. There were so many students in this study whom I will never forget.

Many of my refugee adolescent participants had spent their entire lives in a refugee camp. While this finding was not surprising to me, as I was well aware of how long many groups had been experiencing conflict, it was still very difficult to consider, especially as I now know their faces and their stories. I cannot begin to imagine what many have lived through and yet here they are in the U.S. attending the school. They are smiling and laughing. They are eating pizza and trying Starbucks for the first time. They are hanging out with their friends and they will have a chance at a new life. But what will that new life be? What opportunities will be available to them? Especially the older students—as a former high school teacher, these are the questions I find myself pondering.

If I am able to accomplish anything, it will be to strive to not only “assess” these groups but to work alongside them to utilize their resilience, resourcefulness, strength, and capacity to move forward in their lives and partner to develop programs and interventions that work with them earlier upon arrival with the hopes to reduce their risks, their vulnerabilities. Future work must be community based, participatory, and build upon the many inherent strengths of newcomer groups.

Lastly, although this was an overall positive experience it was most certainly not an easy experience. Community-based research is complicated. It is even more complicated when it involves six languages and requires multiple interpreters and translators to accomplish data collection. There were large cultural and communication barriers with the school staff who served as the initial translators and interpreters to arrive on time and to the right location for data collection. This was especially difficult as all

data were collected during very narrow time constraints (e.g., only Art and P.E. classes, as students could not miss other classes). Each of the school's staff worked different schedules—not all were fulltime staff, and the part-time staff did not have as much time to help with the data collection. There were days where I couldn't locate an interpreter, even if one was scheduled, and I would have students waiting on the interpreter to complete the assent process per the study protocol. At first I relied completely on the school's staff for translation and interpretation, but as I needed to give more surveys and their interpreters/translators had other obligations I began to recruit and train additional individuals. I think at the end of data collection I went from five initial interpreters/translators to a total of 20 in addition to several research assistants. The constant scheduling and communicating with so many moving parts for data collection due to the language barriers was exhausting.

In addition, the narrow time available for data collection was at times very difficult, especially with the middle school students; however, by collecting data during school hours I was assured access to the students on a daily basis. The middle school students needed a lot more help and were much slower taking the surveys, which often required two sessions and then also locating them a second day to finish. Many middle school surveys were left incomplete as the students could not be found or an interpreter could not be present to finish the surveys. Sometimes the students who started a survey and needed to finish were located and the interpreter then couldn't be located or the interpreter was on time and at the right location but the student didn't show up or was not at school that day; the interpreter arrived with nothing to do, which was not enjoyable for

them (especially as all were volunteers and not paid). It seems now looking back to be a miracle how many total and complete surveys were given. In addition to the previously described complexities, enrollment at the school is ongoing year round and new recruitment packets were sent home and the potential participant pool was always shifting.

All frustrations aside, the schools staff, especially the principal, made this study possible. The principal and the school's flexibility in allowing me to return multiple days to reach more students was vital to the success of this study. The principal's support and encouragement to keep locating students and giving surveys until the day before standardized testing started in June (literally right before school let out for the summer) was an enormous gift. It was truly a blessing to work with so many wonderful school staff members. Each one worked hard to help me recruit participants and find students. I am incredibly grateful for the school's staff. This reinforces the value of identifying, building, and maintaining relationships with strong community organizations to support research and programming/interventions. I will be forever grateful to the school's staff and will never forget the many amazing individuals from all over the world with whom I had the privilege to work on this project. I look forward to enriching my life in the future by continuing to partner with and conduct research with diverse populations, especially immigrants and refugees.

### **Future Work**

As the U.S. becomes more and more diverse it is vital to national, state, and local public health goals to better understand the pre- and post-arrival experiences, knowledge,

concerns, interests, and needs of newcomer groups. Due to the evidence of vulnerability and nutrition and health-related disparities and limited data regarding immigrant and refugees (newcomer groups), it is warranted to continue research with these groups. Due to the lifestyle and chronic disease-related risk factors for newcomer caregivers and adolescents, earlier intervention (within the first year in the U.S.) should be explored to reduce long-term weight gain, negative dietary acculturation, and reductions in physical activity. The long-term efficacy of such interventions (e.g., longitudinal studies) will likely be complicated but key in supporting and improving nutrition and health promotion efforts and reducing health disparities.

Future work (particularly assessment studies) should continue incorporating comparative studies with multiple groups; however, interventions and/or resource development should focus on individual groups to ensure proper targeting and cultural appropriateness. Dietary “acculturation” changes as well as physical activity changes should be further explored. Many barriers to physical activity in particular have been reported; however, little work has sought to improve physical activity access and participation, particularly in groups with high language, gender, and cultural barriers. Future work should continue to examine barriers as well as approaches and outreach that can be successful in increasing physical activity opportunities for immigrant and refugee groups, especially in light of their chronic disease risk. Barriers for females for physical activity, their increased concern for weight gain and demonstrated higher levels of ov/ob suggest focusing on gender/female-specific and culturally appropriate physical activities. Furthermore, development of a validated tool to assess the level of dietary and physical

activity changes and/or health literacy to better standardize and measure incoming groups would also be of value. In addition, research should continue to examine concerns relating to body image, especially due to the future risk of poor dietary behaviors and trends for increased BMI and related health concerns as well as the social element with weight, particularly in adolescents.

## **APPENDIX A**

### **LET'S TALK ABOUT FOOD PARENT GROUP GUIDE**

1. What foods do you eat regularly?
2. Are there foods you cannot find you would like to eat?
3. How do you think your diet compares to before you came to the U.S.?
4. Do you have any concerns about what your family or children are eating now that you are in the United States?
5. Would you be interested in learning what foods are important for your child's growth and health?
6. Would you be interested in tasting new foods and trying new recipes with healthy, affordable fresh American foods?
7. Would you be interested in learning about diets that help reduce the risk of hypertension/high blood pressure, diabetes, weight gain, or heart disease?
8. American foods have labels that explain what are in the foods. Would you be interested in learning how these labels can help you make healthy choices?
9. Would you be interested in having someone shop with you to help explain healthy options or American products or how to navigate American grocery stores?
10. Would you be interested in attending nutrition education in your community another day? What topics about nutrition or related health would you be interested in learning about?

## APPENDIX B

### NUTRITION GUIDELINES: PROMOTING YOUR FAMILY'S HEALTH AND REDUCING DISEASE RISK

<p><b>"5 A Day"</b> Eat 5 Fruits and Vegetables Daily</p> 	<p><b>Compare Labels</b></p>  <p>↑Fiber, Calcium, Iron, Vitamin A, C, D ↓Sodium, Saturated Fat, Sugar</p>	<p><b>Re- Think Your Drink</b></p>  <p>Sugary Drinks = ↑weight gain, dental problems, risky for diabetics</p>
<p><b>Choose Whole Grains</b></p>  <p>THE BASIC STAMP      THE 100% STAMP</p>	<p><b>Foods for Bone Health</b></p>  <p>Childhood and adolescence is a very important time for bone growth!</p>	<p><b>Be Active as a Family!</b></p> 
<p><b>Limit these "Sometimes" foods for treats or special occasions</b></p> 	<p><b>Physical Activity and Healthy Diet:</b></p> <p>↑ Energy ↑ Immunity ↑ Bone health</p> <p>↓ Risk Diabetes ↓ Risk of High Blood Pressure ↓ Risk of Heart Disease, Stroke</p>	<p><b>Iron Containing Foods</b></p>  <p>Important for Energy, Growth, Brain Development</p>

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## APPENDIX C

### STUDY FLYER

#### *Let's Talk About Food!*



Project Title: Let's Talk About Food!

Principal Investigator: Lauren Sastre MS

Faculty Advisor: Lauren Haldeman PhD

#### **What is this all about?**

Let's Talk About Food is a study to learn about the food choices and changes new youth and families experience upon arrival in the United States. You are being asked to participate because your family is new to the United States. Your participation in this research project is voluntary. If you choose to participate you can provide feedback about what nutrition and health related topics you believe are important today. Your nutrition and health interests and concerns may help guide the development of resources to support other new families who come the U.S. and North Carolina in the future.

#### **How will this negatively affect me or my family?**

There are no foreseeable risks involved with this study.

#### **What will I or my family get out of this research project?**

You will not likely directly benefit from this study. The information that is collected may be used to develop resources and guide nutrition and health promotion and education to support the nutrition and overall health and well-being of other families in the future.

#### **Will I get paid for participating?**

You will not be paid.

#### **What about my confidentiality?**

No identifying information such as your name or where you live will be asked of you. You will only be asked questions about your interest or concern regarding nutrition or food issues and general health topics.

**What if I do not want to be in this research study?**

You do not have to be part of this project. You do not have to respond to any questions or topics discussed today. This project is voluntary and it is up to you to participate. If you agree to participate, at any time in this project you may stop participating without penalty. If you choose not to participate in this study or to withdraw this will not affect your relationship with or services received from the Doris Henderson Newcomer's School.

**What if I have questions?**

You can ask the research assistant Lauren Sastre 336-202-0599 or the principle investigator Lauren Haldeman PhD 336-256-0311 anything about the study. If you have concerns about how you have been treated in this study call the Office of Research Integrity Director at 1-855-251-2351.

**APPENDIX D**  
**CAREGIVER CONSENT SCRIPT**

Let's Talk Food

Adult Discussion Group Consent Script

Introduction Script (to be translated to primary language by community liaison during the community education day at the school). The flyer (translated into primary language as well) will be circulated during the introduction. This flyer is attached in a separate file.

“Introduction: “Good Morning/Afternoon, thank you for having me here today. I am here to talk about food, nutrition and health. I am a student at a local university in the Department of Nutrition. I have passed around a flyer that describes my project. I have some questions about food and nutrition. If you are would like to participate by raising your hand or discussing any of the points today I will write down your interests or concerns. I will not ask for your name, where you live or any other personal information. I will use the nutrition and health topics you are interested, as well as feedback on foods you like to eat to help me make resources to support good nutrition and health of families with children here at the school in the future. You do not have to share any information. If you choose to I will write down the things you are interested in or concerned about. When I have finished asking a few questions I will be happy to discuss any nutrition or general health topics you are interested in or have concerns about and I will not collect any information then.”

**APPENDIX E**  
**ADOLESCENT GROUP DISCUSSION GUIDE**

Let's Talk About Food  
Student Focus Group Guide:

**I. Opening/Icebreaker Questions**

- a) Let's start off by introducing ourselves by name, where you are from, and something about you, what you like to do or something that is important to you.*
- b) Now let's go around and share one of your favorite foods.*
- c) Great, thank you, today I would like to talk to you about health and healthy eating. I have some questions for us to discuss as a group about health as well as healthy eating.*

**II. Health/Eating Questions**

1. What do you think it means to be "healthy"? Do you think you are healthy? Why or why not?
2. Are there things you can do to be healthy? Are there things that make you less healthy?
3. What is a healthy diet? What foods would be in a healthy diet? What makes them healthy or unhealthy?
4. Do you think your diet is healthy? Why or why not?
5. What do you like to eat? How do you choose what to eat?
6. Are there any foods that have special meaning or are important in your family or culture? What are they? Why are they important?
7. Are there any nutrition or health topics you would like to learn more about? What are they?
8. What have been some of the biggest changes/differences to your everyday eating now that you are in the U.S.? Why do you think your eating has changed?
9. What have been some of the biggest changes/differences in how active you are? Why do you think your activity has changed?

10. What new foods have you tried? (Follow-up questions: a) How do you decide what new foods to try? b) Would you like to try more American foods? why/why not? c) Would you like to learn which American foods are healthy?
11. Do you think how active you are or exercise affects your health? Why or why not? What kind of exercise would you be interested in?
12. Is there anything related to food and nutrition that I did not talk about that you would like to learn more about or talk about?
13. Is there anything related to your health that I did not talk about that you would like to learn more about or talk about?

## APPENDIX F

### ADOLESCENT STUDY FLYER

#### *Let's Talk About Food!*



Project Title: Let's Talk About Food!  
Principal Investigator: Lauren Sastre MS  
Faculty Advisor: Lauren Haldeman PhD

#### What is this all about?

Let's Talk About Food is a study to learn about the diet preferences, choices and changes youth ages 12-17 and families experience when they come to the United States. Your child is being asked to participate in this study because they are new to the United States. This research project involves your child taking a survey about eating and food that will likely take about an hour and a half. Your child may also participate in a small group discussion about eating and general health interests and knowledge. They will also have their height and weight taken. Your child's participation in this research project is voluntary. The survey and small group discussions will take place at school and each will last about an hour and a half for each.

#### How will this negatively affect my child?

There are no foreseeable risks involved with this study. Your child does not have to respond to any question they are not comfortable answering in either the survey or the focus group and they may choose to withdraw at any time.

#### What will my child get out of this research project?

Your child will not likely directly benefit from this study.

#### Will I get paid for participating?

Your child will not be paid.

#### What about my confidentiality?

We will do everything possible to make sure that your child's information is kept confidential. Your child's information will only be accessible by the research assistant and principle investigator of this study. The survey data will be kept in a locked cabinet file and any reports or data from this study will not include identifying information of your child such as their name or where they or you live.

#### What if I do not want to be in this research study?

Your child does not have to be part of this project. This project is voluntary and it is up to you and your child to participate in this research project. If you agree to participate at any time in this project you may

stop participating without penalty. Choosing not to participate in this study or to withdraw at any time will not affect the services provided or your relationship with Doris Henderson Newcomer's School.

**What if I have questions?**

You can ask the principal investigator Lauren Sastre 336-202-0599 or the faculty advisor Lauren Haldeman PhD 336-256-0311 anything about the study. If you have concerns about how you have been treated in this study call the Office of Research Integrity Director at 1-855-251-2351.

**APPENDIX G****PARENT CONSENT FORM****UNIVERSITY OF NORTH CAROLINA AT GREENSBORO**

Project Title: *Let's Talk About Food!*

Principal Investigator: Lauren Sastre, MS

Faculty Advisor: Lauren Haldeman, PhD

Participant (Parent/Caregiver's) Name: \_\_\_\_\_

**What are some general things you should know about research studies?**

Your child is being asked to take part in a research study. Your child's participation in the study is voluntary. You may choose for your child not to join, or you may withdraw your consent for him/her to be in the study, for any reason, without penalty.

Research studies are designed to obtain new knowledge. This new information may help people in the future. There may not be any direct benefit to your child for being in the research study. There also may be risks to being in research studies. If you choose for your child not to be in the study or you choose for your child to leave the study before it is done, it will not affect your relationship or your child's relationship with the researcher or the University of North Carolina at Greensboro.

Details about this study are discussed in this consent form. It is important that you understand this information so that you can make an informed choice about your child being in this research study.

You will be given a copy of this consent form. If you have any questions about this study at any time, you should ask the researchers named in this consent form. Their contact information is below.



**What is the study about?**

This is a research project. Your child's participation in this project is voluntary. The project is to learn about food choices and health and nutrition knowledge of youth who have recently joined our community and/or arrived in the United States.

**Why are you asking my child?**

The reason we are asking your child is that they are new to the community and the United States and they are between the age of 12 and 17.

**What will you ask my child to do if I agree to let him or her be in the study?**

Your child will fill out a survey about food choices and preferences that will last 60 to 90 minutes and have their height and weight measured at school. Height and weight will be measured in a private setting (not in front of other students). Height and weight will be used to calculate your child's Body Mass Index (BMI). BMI is a number calculated from weight and height that provides a measure of body fat that for most people can screen for some health or nutrition risks. BMI will be used in comparison to eating behaviors, nutrition and health knowledge to help develop educational materials that can address diet or health risks to promote health and good nutrition. They can also participate in a small group discussion about food and health another day this will last 60 to 90 minutes at school. The school will help choose the best time (before, after school, during a break) for the survey and group discussions.

**Is there any audio/video recording of my child?**

There will be no audio or video recording.

**What are the dangers to my child?**

Your child does not have to respond to any questions they do not feel comfortable answering on either the survey or during the focus groups and they may choose to withdraw at any time.

The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants.

If you have questions, want more information or have suggestions, please contact the principal investigator Lauren Sastre at (336) 202-0599 or the faculty advisor Lauren Haldeman PhD at 336-256-0311.

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Integrity at UNCG toll-free at (855)-251-2351.

**Are there any benefits to society as a result of my child taking part in this research?**

Information collected in this study may help guide the development of resources to educate and promote health in other youth and/or families who are new to our community in the future.

**Are there any benefits to *my child* as a result of participation in this research study?**

There may not be direct benefits to your child.

**Will my child get paid for being in the study? Will it cost me anything for my kid to be in this study?**

It will not cost you anything and your child will not get paid for being in this study.

**How will my child's information be kept confidential?**

Your child's information will be stored in a locked file cabinet only accessible to the research assistant and principal investigator. Your child's name and any other identifying information will not be included in any reports of this study. Add data with your child's information will be given a code and your child's name will be kept in a separate file on a flash drive that will be stored in a locked cabinet. Electronic data will be stored on a flash drive which will be kept in a locked drawer in the research lab. All information obtained in this study is strictly confidential unless disclosure is required by law.

**What if my child wants to leave the study or I want him/her to leave the study?**

You have the right to refuse to allow your child to participate or to withdraw him or her at any time, without penalty. If your child does withdraw, it will not affect you or your child in any way. If you or your child chooses to withdraw, you may request that any data which has been collected be destroyed unless it is in a de-identifiable state. The investigators also have the right to stop your child's participation at any time. This could be because your child has failed to follow instructions, or because the entire study has been stopped. If you choose not to participate or to withdraw your child at any time this will not affect your relationship with or services provided by the Doris Henderson Newcomer's School. Guilford County Schools is not sponsoring or conducting this research study.

**What about new information/changes in the study?**

If significant new information relating to the study becomes available which may relate to your willingness allow your child to continue to participate, this information will be provided to you.

**Voluntary Consent by Participant:**

By signing this consent form, you are agreeing that you have read it or it has been read to you, you fully understand the contents of this document and consent to your child taking part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are the legal parent or guardian of the child who wishes to participate in this study described to you by

\_\_\_\_\_.

\_\_\_\_\_  
Participant's Parent/Legal Guardian's Signature

Date: \_\_\_\_\_

**APPENDIX H**  
**ADOLESCENT ASSENT FORM**

*Let's Talk About Food!*



**Youth Assent Form**

Project Title: Let's Talk About Food!

Principal Investigator: Lauren Sastre MS

Faculty Advisor: Lauren Haldeman PhD

**WHY AM I HERE?**

We want to tell you about a research study we are doing. Research studies are done to find better ways of helping and understanding people or to get information about how things work. In this study we want to find out more about what you like to eat and what has changed about your eating since you have come to live in the U.S. You are being asked to be in the study because you have come to a new place with new foods. In a research study, only people who want to take part are allowed to do so.

**WHAT WILL HAPPEN TO ME IN THIS RESEARCH STUDY?**

If it is okay with you and you agree to join this study, you will be asked to complete a survey about what you like to eat and what you think about some foods. If it is ok with you, we will also measure how tall you are and measure your weight. Height and weight will be used to calculate your Body Mass Index (BMI). BMI is a number calculated from weight and height that provides a measure of body fat that for most people can screen for some health or nutrition risks. BMI will be used in comparison to eating behaviors,

nutrition and health knowledge to help develop educational materials that can address diet or health risks to promote health and good nutrition. If you are interested, you can also participate in a small group discussion that will take place another day. You do not have to participate in any part of this study. You also can choose to participate in just the survey or the small group discussion, you do not have to participate in both.

#### **HOW LONG WILL I BE IN THE RESEARCH STUDY?**

You will probably spend about 60 to 90 minutes during one day to take the survey and have your height and weight taken. You may also have the opportunity to join a small group discussion to talk about food and health you will spend about 60 to 90 minutes on a different day talking about food and health. You do not have to be in both parts of the study- you can choose to only participate in the survey or the small group discussion.

#### **CAN ANYTHING BAD HAPPEN TO ME?**

Talking about food might make you think about where you came from and miss people you had to leave or foods you no longer can eat.

Sometimes the questions we ask you might seem strange and make you feel uncomfortable/sad You might think about how your life has changed when you think about how what you eat has changed. If you are uncomfortable with some of the questions, please let us know and we will stop or do whatever we can to make you feel better.

#### **CAN ANYTHING GOOD HAPPEN TO ME IN THIS RESEARCH STUDY?**

We do not know if you will be helped by being in this project. However, we may learn something that will help other children and families have healthier lives in the future.

#### **DO I HAVE OTHER CHOICES?**

You do not have to be in this study.

#### **WHAT IF I DO NOT WANT TO BE IN THIS RESEARCH STUDY?**

You do not have to be part of this project. It is up to you. You can even say okay now, but change your mind later. All you have to do is tell us. No one will be mad at you if you change your mind.

#### **WHAT ABOUT MY CONFIDENTIALITY?**

We will do everything possible to make sure that your data and or records are kept confidential.

Unless required by law the following people can review your study records: Lauren Sastre and Lauren Haldeman. They are required to keep your personal information confidential.

#### **WILL I BE PAID FOR BEING IN THIS RESEARCH STUDY?**

You will not receive any money for being in this study.

**DO MY PARENTS KNOW ABOUT THIS RESEARCH STUDY?**

This study has been explained to your parent/parents/guardian and they have given permission for you to be in it.

**WHAT IF I HAVE QUESTIONS?**

You can ask anything about the study by calling the principal investigator Lauren Sastre at 336-202-0599 or the faculty advisor Lauren Haldeman at 336-256-0311. If you have questions about your rights in the study, please call the Director in the Office of Research Integrity at 336-256-1482 or 855-251-2351.

**ASSENT**

This study has been explained to me and I am willing to be in it.

\_\_\_\_\_  
Child's Name (printed) and Signature

\_\_\_\_\_  
Date

Check which applies below:

- ☐ The child is capable of reading and understanding the assent form and has signed above as documentation of assent to take part in this study.
- ☐ The child is not capable of reading the assent form, but the information was verbally explained to him/her. The child signed above as documentation of assent to take part in this study.

\_\_\_\_\_  
Signature of Person Obtaining Assent

\_\_\_\_\_  
Date

## APPENDIX I

### ADOLESCENT SURVEY

*Let's talk about food and health!*



#### I. Demographic Information

What is your name? \_\_\_\_\_

What is your birthdate (day/month/year)? \_\_\_\_\_

What is your grade level in the U.S.? \_\_\_\_\_

Did you attend school before coming to the U.S.? Yes No

If yes, for how many years? \_\_\_\_\_

What is your gender? Male Female

Do you have any siblings? Yes No If Yes, how many? \_\_\_\_\_

Do any of your siblings go to school with you? \_\_\_\_\_

Where were you born (what country)? \_\_\_\_\_

Where was your mother born (what country)? \_\_\_\_\_

Where was your father born (what country)? \_\_\_\_\_

Where were your grandparents born (what country)? \_\_\_\_\_

How many languages do you speak fluently? \_\_\_\_\_

What are they? \_\_\_\_\_

What language do you mostly speak with your family at home? \_\_\_\_\_

Do you speak English at home? Yes No

How long have you been in the United States? \_\_\_\_\_ months \_\_\_\_\_ years

Did you ever live in a refugee camp? Yes No

If yes, how long? \_\_\_\_\_ months \_\_\_\_\_ years

How many people do you live with? \_\_\_\_\_ What is your relationship to the people you live with? (brothers, sisters, aunts, cousins, mom, dad, etc.)

## II. Diet and physical activity: behaviors, perceptions, and changes

### Questions about **BEFORE** arriving in the U.S.:

1) I think my eating before coming to the United States was:

Less healthy than now	Healthy	More healthy than now

2) I think before I came to the United States I was:

Less physically active than now	Similar level of activity to now	More physically active than now

Foods and Activity <b><u>BEFORE</u></b> you came to the U.S.							
	Never	Rarely, or special occasions or celebrations (a few times a year)	Monthly (1-2 times a month)	Weekly (1-2 times a week)	Weekly (3-5 times a week)	Daily (1-2 times a day)	Daily (3 times or more a day)
3) I ate Fruit(s)							
4) I ate Vegetables							
5) I drank Milk (what type? _____)							
6) I drank fruit juice							
7) I drank sodas like Coca Cola							
8) (a) ate meat like chicken, fish or eggs							
8) (b) I ate beans or							

Foods and Activity <b><u>BEFORE</u></b> you came to the <b>U.S.</b>							
	Never	Rarely, or special occasions or celebrations (a few times a year)	Monthly (1-2 times a month)	Weekly (1-2 times a week)	Weekly (3-5 times a week)	Daily (1-2 times a day)	Daily (3 times or more a day)
legumes							
9) I ate salty snacks like chips or crackers							
10) I ate sweet foods like cookies or cake							
11) I was active for fun (like soccer, basketball, volleyball, dancing, games)							

### Questions about Foods in the U.S.

12) I have tried new foods in the United States

Not yet, and I do <i>not</i> want to	Not yet, but I would like to	A Few (1-3 different new foods)	Some (4-5 different new foods)	Many! (more than 5 different new foods)

13) I have tried new beverages in the United States

Not yet, and I do <i>not</i> want to	Not yet, but I would like to	A Few (1-3 different new foods)	Some (4-5 different new foods)	Many! (more than 5 different new foods)



14) I think American food is:

Unhealthy	Healthy	Very Healthy

15 (a) When I eat my traditional foods in the U.S. they taste:

Not as good	Similar to before	Better	I am not sure

15 (b) Finding the traditional foods I ate before I came to the United States is:

Easy for most foods	Easy for some foods but harder for other foods	Hard for most foods	I am not sure

### Questions about Food and Activity in the U.S.:

16) Now that I am in the United States I think my eating is:

Less healthy than before	Similar to before	Healthier than before

17) Now that I am in the United States I think I am:

Less physically active	Similar in my physical activity	More physically active

Foods and Activity <u>AFTER</u> you came to the U.S.							
	Never	Rarely, or special occasions or celebrations (a few times a year)	Monthly (1-3 times a month)	Weekly (1-2 times a week)	Weekly (3-5 times a week)	Daily (1-2 times a day)	Daily (3 times or more a day)
18) I eat Fruit(s)							

Foods and Activity <u>AFTER</u> you came to the U.S.							
	Never	Rarely, or special occasions or celebrations (a few times a year)	Monthly (1-3 times a month)	Weekly (1-2 times a week)	Weekly (3-5 times a week)	Daily (1-2 times a day)	Daily (3 times or more a day)
19) I eat Vegetables							
20) I drink Milk (what type? _____)							
21) I drink fruit juice							
22) I drink sodas like Coca Cola							
23) (a) eat meat like chicken, fish or eggs							
24) (b) I eat beans or legumes							
25) I eat salty snacks like chips or crackers							
26) I eat sweet foods like cookies or cake							
27) I am active for fun (like soccer, basketball, volleyball, dancing, games)							

### III. Food Choices

28) Who chooses what you eat at home?

We eat what my parents or grandparents prefer	We eat what I and/or my siblings want	We eat both foods my parents and me and/or my siblings want

29) Who prepares the food?

My mom does most of the cooking	My dad does most of the cooking	My grandmother does most of the cooking	I cook most of our meals by myself	Different people in my family cook

30) We eat at home:

We eat almost only <b>traditional foods</b> (similar foods from before we came to U.S.)	We have meals with <b>both traditional foods and American foods</b>	We eat <b>mostly American foods now</b>	We eat <b>mostly traditional foods</b> but we <u>do try</u> new American foods

31) Eating at home as a family:

Eating together as a family is a very important part of the day and we eat together	We don't usually eat together as a family	We can't eat together as a family because of work and schedules but it is important to eat as a family

32) How do **you choose** what to eat?

	Not important	Somewhat important	Very Important
a) Taste—it has to taste good to me			
b) Cost—is does <b>not</b> cost a lot of money			

	Not important	Somewhat important	Very Important
c) Health—I want to eat things that are good for me			
d) Time—is it fast to make or get			
e) Convenience—is it easy to get			
f) Religion—the food has to be allowed by my religion			
g) My family—if they want me to eat it I will			
h) Culture—is the food something familiar to me or that my community or culture eats			
i) U.S. foods—I see American's eating the food, so I try it/eat it			
j) Friends—my friends eat the food so I try it/eat it			
k) TV—I saw the food on TV so I try it/eat it			

#### IV. Health and Diet Interests, Attitudes, Knowledge and Concerns

	No/ I Disagree	Not Sure, Maybe	Yes/ I Agree
33) I would like to learn about how food affects my health			
34) I am worried about the health of someone in my family			
35) I think I am healthy			
36) I think what I eat affects my health			
37) I think being physically active helps me to be healthy			
38) I think my diet could be healthier			
39) I think my family needs to learn what foods are healthy in the U.S.			

	No/ I Disagree	Not Sure, Maybe	Yes/ I Agree
40) I would like my family to learn how to cook American foods			
41) My family talks about my weight to me (who talks about your weight? _____)			
42) I have tried to lose weight			
43) I think my weight is good			
44) I would like the opportunity to play more sports (what sport? _____)			
45) I would like to be more active			
46) I would like to exercise with only other boys/girls			
47) I would like to _____ for exercise			

48) What foods do you think are healthy or unhealthy? List as many as you can think of!

Healthy Foods	Unhealthy Foods

49) What foods are important to eat regularly?

--

50) Are there special foods to eat (or not eat) for health or religious or cultural traditions in your family? What are they?

--

51) Is there something about food or health that you would like to learn about that we didn't ask?

Food/Nutrition	Health
<p><b><i>To be filled in by research assistant:</i></b></p> <p><b>Height:</b> _____ <b>Weight:</b> _____ <b>Calculated BMI:</b> _____</p>	

**APPENDIX J**  
**SURVEY VARIABLES**

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
1	Survey Code	English 100+ (e.g., 101, 102, etc.) Spanish = 200+ French=300+ Arabic=400+ Vietnamese=500+ Burmese=600+	
2	Age	Continuous, range	
3	School Pre-U.S.	Yes =1 No =2	
4	School Pre-U.S. (years)	Continuous, range	
5	Gender	Male =1 Female =2	
6	Number Siblings	Continuous, range	
7	Birthplace*	1=Nepal 2=Bhutan 3=Kenya	Southeast Asia =1,2,15,16,33,34,35  Africa=3,4,5,9,10,11,12,13,14,17,18,19,20, 30, 31  Latin America/Caribbean=21,22,23,24,25,26,27  Middle East=6,29,32
8	Mom's Birthplace*	4=Somalia 5= Ethiopia 6=Pakistan 7=Israel 8=Soviet Union 9=Liberia 10=Rwanda 11=Congo 12=DRC Congo 13=Eritrea 14=Tanzania 15=Bangkok 16=India 17=Central African Republic 18=Senegal 19=Burundi 20=Niger 21=Mexico 22=Honduras 23=El Salvador 24=Cuba 25=Puerto Rico 26=Guatemala 27=Dominican Republic 28=U.S. 29=Iraq 30=Sudan 31=Egypt 32=Saudi Arabia 33=Thailand 34=Burma 35=Vietnam	
9	Number total Languages spoken	Continuous, range	
10	Primary language spoken at home*	1= English 2=Spanish 3=French 4=Arabic 5=Vietnamese 6=Burmese 7=Nepali 8=Somalian 9=Amharic 10=Urdu 11=Oromia	

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
		12=Hebrew/Russian 13=Kenyanwanda 14=Swahili 15=Tigrigna 16=Thai 17=Crujarati 18=Olaf 19=Burmese 20=Karen 21=Jarai 22= Montagnard	
11	English at home?	Yes=1 No=2	
12	Time in U.S.	Continuous, range	
13	Refugee Camp	Yes=1 No=1	
14	Time in Refugee Camp	Continuous, range	
15	Household Size	Continuous, range	
16	I think my eating before coming to the United States was:	Less healthy than now = 1 Healthy =2 Healthier than now =3	
17	I think my physical activity before coming to the United States was	Less physically active than now =1 Similar level of activity to now=2 More physically active than now=3	
18	Pre-U.S. fruits	1= Never 2= Rarely 3= Monthly (1-2x) 4=Weekly (1-2x) 5= Weekly (3-5x) 6= Daily (1-2x) 7= Daily (3+)	
19	Pre-U.S. Vegetables		
20	Pre-U.S. Milk		
21	Pre-U.S. Fruit Juice		
22	Pre-U.S. Sodas		
23	Pre-U.S. meat: fish, chicken, eggs		
24	Pre-U.S. beans/legumes		
25	Pre-U.S. Salty Snacks		
26	Pre-U.S. Sweets		
27	Pre-U.S. Physical Activity		
28	I have tried new foods in the U.S.	Not yet, do not want too=1 Not yet, would like too=2 A few (1-3) =3 Some (4-5) =4 Many! (5+) =5	
28	I have tried new beverages in the	Not yet, do not want too=1 Not yet, would like too=2	



Variable	Survey Question	Responses (Coded)	Re-Coded Variables
	U.S.	A few (1-3) =3 Some (4-5) =4 Many! (5+) =5	
30	I think American food is	Unhealthy =1 Healthy =2 Very Healthy =3	
31	When I eat my traditional foods in the U.S. they taste:	Not as good=1 Similar to before=2 Better=3 I am not sure =4	
32	Finding the traditional foods I ate before I came to the U.S. is:	Easy for most foods =1 Easy for some foods, harder for others=2 Hard for most foods =3 I am not sure=4	
33	Now that I am in the U.S. I think my eating is:	Less healthy than before =1 Similar to before=2 Healthier than before=3	
34	Now that I am in the U.S. I think my physical activity is:	Less physically active =1 Similar in my physical activity =2 More physically active =3	
35	Post-U.S. fruits	1= Never 2= Rarely 3= Monthly (1-2x) 4= Weekly (1-2x) 5= Weekly (3-5x) 6= Daily (1-2x) 7= Daily (3+)	
36	Post-U.S. Vegetables		
37	Post-U.S. Milk		
38	Post-U.S. Fruit Juice		
39	Post-U.S. Sodas		
40	Post-U.S. meat: fish, chicken, eggs		
41	Post-U.S. beans/legumes		
42	Post-U.S. Salty Snacks		
43	Post-U.S. Sweets		
44	Post-U.S. Physical Activity		
45	Who chooses what you eat at home?	Eat what parents/grandparents =1 Eat what I/siblings want=2 Eat both parents/kids want=3	
46	Who prepares the	Mom=1	

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
	food? (most of the time)	Dad=2 Grandmother=3 I do=4 Different people =5	
47	We eat at home	Only traditional =1 Both traditional/American =2 Mostly American foods=3 Mostly traditional, try some new=4	
48	Eating at home as a family	Very important, usually do=1 Don't usually do=2 Cant, but is important=3	
How do you choose what to eat?		Not important =1 Somewhat important=2 Very important =3	Not important=1  Somewhat/V ery Important=2
49	Taste- it has to taste good to me		
50	Cost- is does <i>not</i> cost a lot of money		
51	Health- I want to eat things that are good for me		
52	Time- is it fast to make or get		
53	Convenience- is it easy to get		
54	Religion- the food has to be allowed by my religion		
55	My family- if they want me to eat it I will		
56	Culture-is the food something familiar to me or that my community or culture eats		
57	U.S. foods- I see American's eating the food, so I try it/eat it		
58	Friends- my friends		

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
	eat the food so I try it/eat it		
59	TV- I saw the food on TV so I try it/eat it		
Health and Diet Interests, Attitudes, Knowledge and Concerns		No/I Disagree =1  Not Sure, Maybe=2  Yes/I Agree =3	No/I Disagree =1  Not Sure/Maybe/ Yes/I Agree =2
60	I would like to learn about how food affects my health		
61	I am worried about the health of someone in my family		
62	I think I am healthy		
63	I think what I eat affects my health		
64	I think being physically active helps me to be healthy		
65	I think my diet could be healthier		
66	I think my family needs to learn what foods are healthy in the U.S.		
67	I would like my family to learn how to cook American foods		
68	My family talks about my weight to me (who talks about your weight?)		
69	(who talks about your weight?)	Mom=1 Dad=2	

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
	_____)*	Grandparent=3 Brother=4 Sister=5 Friend=6 Uncle=7 Aunt=8 Cousin=9 Mom and Dad=10 “People”=11 Family=12 Husband=13	
70	I have tried to lose weight	No/I Disagree =1	No/I Disagree =1
71	I think my weight is good	Not Sure, Maybe=2	Not Sure/Maybe/ Yes/I Agree =2
72	I would like the opportunity to play more sports (What sport ? _____)	Yes/I Agree =3	
73	Sports*	1=walking; 2=running; 3=ride bike; 4=dance; 5=swim; 6=volleyball; 7=soccer/futbol; 8=basketball; 9=American Football; 10=Baseball; 11=cricket; 12=golf; 13=weight lifting; 14=sports; 15=gym; 16=train/practice; 17=Badminton	
74	I would like to be more active	No/I Disagree =1	No/I Disagree =1
75	I would like to exercise with only other boys/girls	Not Sure, Maybe=2	Not Sure/Maybe/ Yes/I Agree =2
76	I would like to _____ for exercise	Yes/I Agree =3	
77	I would like to _____ for exercise*	1=walking; 2=running; 3=ride bike; 4=dance; 5=swim; 6=volleyball; 7=soccer/futbol; 8=basketball; 9=American Football; 10=Baseball; 11=cricket; 12=golf; 13=weight	

Variable	Survey Question	Responses (Coded)	Re-Coded Variables
		lifting; 14=sports; 15=gym; 16=train/practice; 17=Badminton	
78	Height (cm)	Continuous, range	
79	Weight (kg)	Continuous, range	
80	BMI	Continuous, range	
81	BMI percentile	Continuous, range	Normal =1 Ov/ob=2
82	Survey Language	English=1; Spanish=2; French=3; Arabic=4; Vietnamese=5; Burmese=6	

\*These were “free” response (short answer) questions. As the surveys were reviewed and analyzed numerical codes were assigned to each unique short answer response.